

A MODEL FOR AN AGRICULTURAL EDUCATION PROGRAM
IN SOUTH VIETNAM

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South Vietnam developed its own agricultural education program in 1952. In 1967 it requested the United States Agency for International Development to survey its agricultural education program and recommend improvements. The American aid, however, concentrated at the college level of the program while in its economic development, South Vietnam, needed more technical and vocational graduates.

The purpose of the study was to establish a model of a secondary agricultural education program for South Vietnam and to suggest an agricultural teacher training curriculum with the latter being the subgoal of the study.

The historical approach was used in the research. The problem data were collected and analyzed through: a review of literature and research done in the United States and neighboring countries of Vietnam, an analysis of census data and research of South Vietnam's potential of agriculture and needs of manpower to develop such potential, and written resources in agricultural education and personal interviews.

Findings indicate:

1. South Vietnam's economy is mainly agriculture. In spite of damages due to war, its agricultural potential still exists. Census data showed an increase in production in rice, pork, poultry, fish and vegetables. Forests still produce 52,706 cubic meters of pine and 656,647 cubic meters of timber in 1971. More than a million hectares of crop potential land are available. Both soils and climate are conducive to diversified agriculture.

2. Neighboring markets and world demand for agricultural products are still very important. Since 1960, Hong Kong, Singapore, Japan, Taiwan, and the Republic of Korea have increased their imports of agricultural products two to five times.

3. Surveys indicate that: an annual average of 173,750 new members of South Vietnam's labor force will be engaged in agriculture in the next decade; 360,000 war refugees will settle in farming when peace comes; and 2,717 college graduates and 7,945 vocational trainees will be needed in the next decade. Yet South Vietnam's agricultural education program was developed to handle less than 2 percent of the student population.

4. The South Vietnamese agricultural education program is very much influenced by its original program, established by the French in 1917, to train civil servants. In its evolution it has changed from such a program, re-established in 1952, to one which presently includes prevocational agriculture, vocational agriculture, technical agriculture, and short term training of adult farmers. Its main objectives are: to train technicians and agents for both

the government and private sector, to provide vocational agriculture, to train ethnic minorities in agriculture, and to prepare students for college.

5. The present agricultural education of South Vietnam is focused on subject matter. It is heavy in selective nationwide exams. The program content is heavy in courses and theories. Students go to class 36 - 40 hours a week. The instruction stresses replicative use of knowledge.

6. The agricultural education program and students therein have experienced the following: agricultural students are not looked down upon by academic students, and continuity and flexibility are inherent in the system. Many improvements have been made in the teaching of humanities and sciences, the instruction of Supervised Farming, the measurement, and the introduction of the Future Farmers of Vietnam.

Recommendations include: a model of a secondary agricultural education program where the structure is reorganized to keep South Vietnamese program's qualities while correcting its deficiencies in organization design, program content, staffing, instruction and measurement; and an agricultural teacher training curriculum where all offerings are to prepare student teachers to better implement an agricultural education program emphasizing cognitive knowledge and manipulative skills for fulfilling the country's needs for agricultural teachers and agricultural school administrators.

CHAPTER I

INTRODUCTION

Looking into the economics of Vietnam, the United Nations (1959, pp. 25 - 28) reported that land and water are the main resources of the country, and the Vietnamese economy is primarily agricultural. The national income data of Vietnam indicates that approximately one third of the gross domestic product is furnished by agriculture and fisheries.

Historically, rice and rubber have been the principal crops of French Indochina. On the eve of World War II, the total rice production of Cambodia, Laos and Vietnam was about 6.5 million metric tons. Total exports were about one million metric tons annually, of which the greatest bulk came from the Mekong River Delta in South Vietnam and the balance from Cambodia. About half of the potential in rubber production of French Indochina was in the territory of the present Republic of Vietnam or South Vietnam. Exports of rubber reached the pre-World War II level of 50,000 metric tons several years ago in South Vietnam. Maize, sugar, fats and oil, tobacco, coffee and tea also form a part of the agricultural contribution to the total income of South Vietnam.

Contributions made by fisheries to French Indochina income in 1954 comprised 25 percent of the agricultural contribution. Vietnam was the second richest fishing territory in the three countries

making up French Indochina. The most bountiful fishing waters of Vietnam, however, are located in the waters off South Vietnam.

Hayden (1972, pp. 33 - 58), however, indicated that "according to a study for the American Association of Science, twenty million craters have been left on the landscape of Indochina." Craters from B-52 strikes approximately forty-five feet wide and thirty feet deep have been dug in many places in South Vietnam's fertile land. Defoliation operations of the war have destroyed thousands of hectares of forests and crops. "Four million acres or one-half the arable land of South Vietnam were seriously affected according to the Japanese Science Council. Half the mangrove forests of the Mekong Delta have been permanently destroyed, and one-fifth of the hardwood forests in South Vietnam damaged (enough hardwood timber to supply the domestic construction market in South Vietnam for thirty years, according to E. W. Pfeiffer's report to the AAAS)."

The United Nations (1959, pp. 25 - 28) also pointed out that the partition of Vietnam by the Treaty of Geneva in 1954 left a very modest industry quota to South Vietnam. Tobacco, alcohol, soft drinks, match, and sugar industries were in the Republic of Vietnam. The Democratic Republic of Vietnam or North Vietnam fell "heir to the large scale manufacturing and mining industries of French Indochina - textiles, cement and coal."

South Vietnam, therefore, does not appear to have the resources necessary for a massive industrial development. It was badly hurt by the restrictive French controls over its development. It has been ravaged by two long wars: the war for independence and the civil war.

It lacks almost everything it needs to develop the country, to improve the standard of living of its population except courage, determination, and undeveloped agricultural resources.

A real development can be possible only if there is at least a certain amount of money, equipment and knowledge. South Vietnam may borrow some of these elements from industrialized countries; however, as a developing country it will not progress very far using only the intelligence of others (Unesco, 1963, pp. 23 - 33).

Under the above circumstances there are obvious advantages in looking to the South Vietnamese agricultural potential in training appropriate qualified manpower to develop this potential, and in improving the education and training to increase efficiency.

Therefore, it is desirable to examine the South Vietnamese agricultural educational program at the end of the war and the start of an era of development. The agricultural education program of South Vietnam was developed according to a French educational philosophy and then shaped according to a Vietnamese philosophy which was recently under strong American influence. If the program is not responsive to the present needs of the country and its society, then it is the appropriate time to change the program.

The Vietnamese agricultural education program was started in 1917. A college-level school was established in Hanoi to train "engineers" in agriculture and in forestry, veterinarians and forest rangers. Agricultural training was also provided at the agricultural schools of Tuyen Quang (North Vietnam), Ben Cat (South Vietnam), and Takhmau (Cambodia). The first two were to train "agricultural agents;"

the last one, serving only Cambodia, was to train "agricultural technicians". All except the school in Cambodia were closed and ruined during the Vietnamese War for independence in 1945 - 1954.

Recognizing the importance and need of qualified manpower for the development of its agricultural economy, the Republic of Vietnam established the Directorate of Agricultural Education at Saigon (1952) and three agricultural schools at Baoloc (1955), Cantho (1957), and Hue (1959). These schools were to train "engineers, technicians and agents" in agriculture (agronomy), animal husbandry and forestry for the government, mainly to serve as the Department of Agriculture's staff.

New objectives were developed from 1963 through 1971. It was then that the American influence appeared in shaping the South Vietnamese agricultural education program, that the South Vietnamese agricultural education program changed its objectives. The main objective accepted by both the college and secondary educational levels is to train engineers, technicians, and agents for both the government and the private sector. Additional objectives of the secondary agricultural education program are to train prospective farmers and to upgrade the present ones. Since 1963 twenty-eight agricultural high schools and two colleges of agriculture have been established.

All these developments are, however, poor in quality. The government of South Vietnam has been, and still is, undecided and hesitant about what constitutes a proper agricultural educational program for the country.

At the request of the Republic of Vietnam, a team from the University of Florida was invited by the United States Agency for International Development to study the existing agricultural education program and make recommendations for improvement. The first team arrived in Saigon on January 22, 1967 and remained until March 17, 1967. Its study and recommendations, however, were aimed at the college level (University of Florida Team, 1967). Subsequent Florida teams also limited their work to the development of the College of Agriculture in Saigon.

Thus, the problems in the secondary level program of agricultural education of South Vietnam have been left almost totally unsurveyed. No clear plans for improvement have been made for this program which includes prevocational, vocational, and technical agricultural education. Meanwhile, the development of the agricultural economy of a developing country depends more on its farmers and its technicians than on its engineers (Malassis, 1966).

The Problem

The purpose of the study was to develop an effective long-range model program in secondary agricultural education for South Vietnam and a teacher training curriculum to provide the trained manpower to carry out the secondary agricultural education program.

The solution to the above problem requires three approaches - all necessary and supplementary to each other, namely:

to make an analysis of the past trends and present status of the agriculture of South Vietnam. Such an analysis would point out the potential of the economy of the country and the types of manpower needs which the South Vietnamese agricultural education has to meet.

to survey the past and present agricultural education programs in South Vietnam. Such a survey evaluates the effectiveness of the programs and indicates improvements the new model must have.

to make an analysis of the main approaches in planning an agricultural education program in the United States and developing countries neighboring South Vietnam. Such an analysis helps determine other criteria which can be used in the development of the new model program and the appropriate agricultural teacher training curriculum.

Scope of the Study

The study was concerned with the secondary level of agricultural education programs, usually called secondary agricultural education in South Vietnam. This level includes the prevocational, vocational and technical agricultural education programs.

The agricultural education program of South Vietnam was studied from 1917 to 1972. Since 1972 the program of agricultural education has remained static, waiting for an overall change in education to meet the post-war period's needs.

Limitations of the Study

The study was subjected to three limitations:

Method Limitation.- The study had to use the historical approach. The suggested model program, built from conclusions of such an approach, would be better if the procedure was followed by a consensus approach and the opinion statistically tabulated and analyzed. Finding experts of the Vietnamese agricultural education program, however, was impossible.

Literature Limitation.- Other than the study of the University of Florida Team (1967), a few Arretes and Orders, there are no other

known resources related to or studies done on the agricultural education program of South Vietnam.

Author Bias and Knowledge Gaps. - The program and curricula of each country's educational system have their own characteristics to meet its own needs. The author had to use his best judgment to adapt the theories and research in program planning and teacher training education of other countries in the development of a model for an agricultural education program and an agricultural teacher education curriculum for South Vietnam. It was, however, impossible for the author to avoid and exclude totally his bias and knowledge gaps.

Definitions of Terms

The following terms were used either to translate French or Vietnamese words which do not have the exact corresponding English word, or to indicate what the author meant:

"Engineer" - An "Engineer" degree is provided to a graduate of a four-year college of agriculture (agronomy), animal husbandry or forestry. The graduate then assumes the title of Engineer in... depending on the field of specialization he has chosen. For example an engineer in agriculture in Vietnam is a college graduate who majors in agronomy.

"Technician" or "Senior Technician" - The title added to the degree given to the graduate from a post-secondary technical training program. The graduate also assumes the title of Technician. The training, formerly three years in length, has been reduced to twelve months, but the required qualifications of the recruits are higher.

"Agent" or "Junior Technician" - The title added to the degree given at graduation from a technical training where the students had finished the ninth grade in vocational education.

"Junior Cycle Secondary Education" - The high school education in South Vietnam goes from grade 6 through grade 12. The first four years of this system is called the junior cycle secondary education.

"Junior Diploma" - The degree obtained through a nationwide exam organized at the end of the junior cycle secondary education.

"Senior Cycle Secondary Education" - The second part of South Vietnamese high school education including grades 10 through 12.

"Baccalaureate I and II" - The two degrees obtained through nationwide exams organized at the end of the 11th and 12th grades.

"Arrete" - A legislative act from and signed either by the Governor General of French Indochina or the Chief Executive of the Vietnamese government.

"Order" - A legislative act from and signed by a Minister in the Vietnamese government.

"Model" - A semantic and schematic representation of the program or curricular structure. It may be used as a prototype for planning.

"Curriculum" - The entire body of experiences offered to a population of students in a program of education to achieve a set of broad objectives.

"Program" - The entire plan indicating different curricula and their implementation through direct instruction and other means in an educational system to achieve broad objectives.

Procedures

The historical approach was used.

Two methods were followed in the collection of data. They were the intensive reading of available written resources, both primary and secondary, and the personal interviews of a number of Vietnamese and American educators having participated and contributed to the development of the agricultural education program of South Vietnam, both in Vietnam and in the United States.

The sources of data from which the study was made were largely records of a public nature. Administrative Arretes and Orders of the French Protectorate government during the period 1917 - 1945, and of the Republic of Vietnam from 1952 to 1972 were used as a source of legislation about the agricultural education program of South Vietnam. Census reports from the Department of Agrarian Reform and Agriculture and those from the Department of Labor, South Vietnam, were classified, summarized and interpreted to determine the past and present status of the agricultural economy and to indicate the future agricultural potential of South Vietnam and the need of skilled manpower for the development of this potential.

Memoranda exchanged between the Directorate of Agricultural Education of South Vietnam and the agricultural high schools, staff meetings and interviews of a number of educators in the Vietnamese government and the United States Agency for International Development, Saigon, have helped clear and add coherence to the data when describing and analyzing the status of South Vietnam agricultural education.

All data and information obtained, either from written materials

or from personal interviews, were checked and re-checked in order to insure the greatest possible degree of accuracy. Where several sources of information were available on a given topic, the sources from published materials were used in preference to unpublished materials. Original manuscripts were used in preference to reproduced or duplicated reports. Information obtained from personal interviews was checked against written resources, and if found in conflict, the written information was selected over the oral.

Data regarding agricultural educational program planning and agricultural teacher training curricula in the United States and neighboring countries of Vietnam were secured through a survey of literature and related research in libraries.

Once the data were collected and checked the study was organized to bring together: a review of various approaches in planning agricultural education programs and curricula and of agricultural teacher education in the United States and developing countries around South Vietnam; a survey of the potential of agriculture in the South Vietnamese economy and the development possibilities of that economy during the post-war period; a survey of qualified manpower in the agricultural development of the country after the war; and an analysis of the history and present status of South Vietnamese agricultural education programs.

From the above surveys and analyses recommendations for change in South Vietnam's agricultural education program were made in the form of a long-range effective model of secondary agricultural education programs including the levels of prevocational, vocational, and

technical agriculture which are presently a part of the South Vietnamese agricultural education program; and a suggested teacher training program at the college level to provide agricultural teachers to carry out the above indicated programs at the secondary level.

The following steps were used to accomplish the above design:

Chapter I is an introduction of the background, purpose, scope and delimitations of the study, the definition of terms, and procedures used in gathering the data and their analyses leading to the solutions of the problem.

Chapter II is a review of literature concerning related research in planning: agricultural education programs and curricula; and agricultural teacher education programs in the United States and in the developing countries neighboring Vietnam. Chapter II also provides the theoretical bases of planning procedures and certain criteria which the solutions of the problem must have.

Chapter III deals with South Vietnam. Sections of the chapter cover: a brief description and analysis of the physical features, climate and the importance of agriculture in South Vietnam; an analysis of manpower needs in the agricultural development of South Vietnam; a review of the historical development of South Vietnam's agricultural education program; an evaluation of the secondary agricultural education program in South Vietnam.

Chapter IV contains the recommendations of the study. They are: a model for a secondary agricultural education program in South Vietnam, and an agricultural teacher training curriculum.

The model is clarified by a set of guidelines for planning the

prevocational, the vocational and the technical curricula. The teacher training curriculum suggests the objectives, the recruitment procedures and the course content for the technical and professional courses.

CHAPTER II

REVIEW OF LITERATURE

As Hines (1972, p. 163) indicated, too many of us tend to operate, perhaps subconsciously, on the generalization that history began with me. Indeed, to draft a proposal for change, to evaluate one's innovations, to develop a program or a curriculum the curriculum worker needs to view the whole field of curriculum planning through a historical perspective.

The purpose of this chapter is to review various approaches in the development of program and curricula in agricultural education mainly at the secondary level, and in agricultural teacher training in the United States and in the neighboring developing countries of South Vietnam. Such a historical perspective provides part of the solution to the problem asked by this research.

Agricultural Education In the United States

1. Generalities

Looking into the past approaches in curriculum planning, Hass (1969, pp. 5 - 8) indicated that three main approaches had been used:

the subject matter, the economic aspect and the society approaches. He proposed a new approach which is to study the social forces, the human development, the nature of learning and the nature of knowledge as the major sources of guidance for decision making in curriculum planning and the planning of teaching (Hass, 1974, p. xvii).

Alexander (1974, pp. 189 - 241) pointed out that there are five main curriculum designs if one classifies them on the basis of focus. These include the designs focused on: specific competencies, disciplines or subjects, social activities and problems, process skills, and individual needs and interest.

However as both Taba (1962, pp. 414 - 415) and Alexander (1974, p. 241) indicated, design should follow function rather than vice versa, and consequently a comprehensive program may use more than one design.

It is necessary, therefore, that program and curriculum planners in agricultural education be knowledgeable about designs and the design process in educational programs.

At the prevocational level, many programs have been established. Their design is focused on subject matter with some modification such as the block system or wheel program in Florida. No research, however, has been done on which design should be used. Al Salman's (1965, p. 1) survey of the prevocational education level in agriculture in New York revealed that the three most important objectives of the prevocational

education program in agriculture were: (1) to acquaint pupils with career possibilities, agricultural problems, and sources of information; (2) to provide opportunities to explore the extent and importance of farming and other agricultural occupations in a community; and (3) to develop an understanding and appreciation for the importance of agriculture to producers and consumers. Al Salman also reported that the areas of orientation and guidance and conservation of natural resources were ranked as the most important areas of instruction for a course designed to accomplish the above objectives.

Post secondary education in agriculture is rapidly developing as a technical education program. Here too, investigators have done little in the area of how programs should be planned. Almost all existing programs use the occupational analysis to determine the content and their program design is focused on specific competencies. A few examples of such research follow:

Halterman (1964) established a definition for the term "agricultural technician". He identified the agricultural technician education as: (1) an extended period of specialized education beyond high school, less than that required for a baccalaureate degree in agriculture and related areas of instruction; and (2) the acquisition of skill and ability to make practical applications of theoretical knowledge in performing specific tasks in the production of goods and services. He concluded that programs of technical education should

emphasize the development of technical and cognitive skill in contrast to manipulative skills.

Voorhies (1964) reported that most of the courses offered in agricultural technical education in California were for transfer credit to four-year institutions rather than as a part of a terminal curriculum.

Clary (1965) in his study of the guidelines for the development of training programs for agricultural technicians identified twenty five institutions which were offering fifty nine different training programs.

The major thrust of research in program planning in agricultural education is at the secondary level, where program development can be examined in two aspects, namely: program and curriculum planning and procedure to determine the content.

2. Program and Curriculum Planning in Secondary Agricultural Education

Four types of program and curriculum planning have been developed in secondary agricultural education: the traditional design, the integrated or cross-sectioned design, the specialized course design, and the experimental design.

a. The Traditional Design

The approach of the first high school program in agriculture was to teach a different subject each year: crops and soils in the first year (9th grade), animal science in the second year (10th grade), farm mechanics in the third year (11th grade), and farm management in the fourth year (12th grade).

Although this four-year sequence was typical, each school determined from its own community needs exactly what four courses were needed and what content should be covered or included in each course. Eaton (1917, p. 70) surveyed seventeen states and reported a tendency for first year agriculture to include soils and vegetable crops, the second year to include farm crops and fruit production, the third year to include animal husbandry, and the fourth year to include farm management and farm mechanics. The major point of the traditional program was that subject matter was identified by courses and taught in such a way that it isolated agricultural subjects.

Hamlin (1949, p. 70) justified this traditional program by identifying three reasons for agricultural subjects being taught as whole year courses: (1) the organization of subjects in colleges of agriculture was easily transferred to high school; (2) textbooks were written about a particular subject and teachers relied extensively upon textbooks; and (3) the earliest agricultural courses were in the first two years of high school and as later courses were added, the content of the first two years was left undisturbed.

b. The Integrated or Cross-Sectioned Design

In this approach, agricultural educators cut across all divisions of subject matter within a given field of study and then integrated the subject matter in a sequence to match the background,

the maturity and the competence of the students. This approach also, allowed the teacher to focus his teaching on seasonal needs of the rural community.

Deyoe (1939) pointed out that the integrated design offered a number of advantages: (1) flexibility in meeting student needs and interest as these are associated with the supervised farming and other activities in vocational agriculture, thus, the teacher could teach things that belonged together; (2) graduation and distribution of course materials in keeping with successive levels of understanding as each boy gains maturity and experiences; (3) continuity of learning; and (4) possibility in the organization of the school activities as those on the farm, giving the students an understanding of the complex inter-relationship of the activities in a well planned farm business.

Thompson (1973, p. 164) indicated, however, that the integrated design had its weaknesses too. The major one was its formlessness which, Hamlin (1950, pp. 35 - 44) pointed out, can be avoided by allocating particular units to a special place in the four-year program. Hamlin did mention, however, that teachers plan their activities from day to day instead of a four-year sequence. Other weaknesses brought out by Thompson were: (1) no guarantee that a four-year course is more than a hodgepodge of related units; (2) difficulty in the transfer of the students since the content of a subject may vary from school to school;

and (3) non-compatibility with today students whose occupational goals are diverse.

The integrated agricultural program eliminated the traditional subjects and designated the successive years under the non-descriptive titles of Agriculture I, II, III, and IV.

The swing from the four one-year courses' traditional program to the four years of integrated content program in secondary agricultural education was well underway by 1927 and used most in the fifties. Hamlin and Sanford (1943, p. 15) formulated the rationale for such a shift. They specified that farming involved the integration and skills from the specialized areas of agriculture and students seeking solutions to actual problems must not be tied by an artificial structure of subject matter. In 1950 and 1960, reviewing the secondary agricultural educational program, Hamlin and Deyoe (1950, pp. 35 - 44) and Sledge (1960, pp 48 - 59) found the program organized on the integrated basis rather than in terms of separate one-year subjects.

Thompson (1973, p. 163) indicated that a modified integrated program had been developed by a large number of high schools. In such a modified pattern, a major unit for each year is identified, then a limited number of other units are added to it.

c. The Specialized Course Design

Zurbrick (1965) indicated there was an emerging trend in

program development of vocational education. In a query of teacher educators in agriculture in thirty-nine states to ascertain their opinions concerning the value of specialized courses offered or planned in each state, he found that the specialized course design was used to develop the secondary agricultural education program in twenty-nine of the thirty-nine states.

Beard (1965) indicated that the view generally accepted concerning the specialized course design was that it should offer in the first two yearsⁱ introductory courses in agriculture emphasizing the basic principles of plant science, animal science, soil science, and related mechanics. These courses were to familiarize students with occupational opportunities in agriculture. Specialized instruction was offered in the last two years of high school. In this specialization program the assignment of titles to courses indicated the content. For example, basic agriculture, agricultural science, agricultural mechanics or agricultural business were in contrast to the course titles of Agriculture I, II, III, and IV.

The breaking from the integrated design was complete when the United State Department of Health, Education and Welfare standardized the terminology for curriculum and instruction in local and state school systems (National Center for Educational Statistics, 1971, pp. 153 - 155). Like the two previous program

and curriculum designs, the focus was still on subject matter. Agricultural education was called a subject-matter area along with nineteen other programs. Agriculture is taught in eight subject groups or areas of subject matter and reported under the following content titles: agricultural production, agricultural supplies, agricultural mechanization, agricultural products (processing), ornamental horticulture, forestry, agricultural resources, and other agriculture instead of Agriculture I, II, III, and IV.

d. The Experimental Design

The Vocational Education Act of 1963 broadened the purposes of agricultural education. As a result a new design came up during the first half of the 1960's and for the purpose of this research was identified as the experimental design. The general process was to select the subject matter according to various criteria. Hypotheses were then formed suggesting that the tentatively selected subject matter was interesting, resulted in learning and met the conditions of the criteria. Specifying and prescribing the experimental conditions was the third step. In the fourth step the objective techniques for determining the results were specified. These may involve a pre- and post-test with a control group, interview with the respondents, or an analysis of perfor-

manances and records. The final step was to check the results against the criteria.

Three groups of programs can be identified as using the above design: the pilot or demonstration program, the work-experience program, and the interdisciplinary approach design. A few examples and some main points of these programs follow:

Clary (1964, pp. 14 - 15) and Phipps (1965, pp. 26 - 28) gave guidelines for establishing pilot programs in secondary agricultural education.

An example of a work experience program was reported by Cushman et al. (1968). Cushman developed guidelines and procedures for conducting directed work experience programs which were given a one-year trial in eighteen schools in twelve northeastern states. In comparing the students under these programs with students in similar programs without work experience, findings indicated the program content must include work experience. Also an experimental design in program planning helps point out the strength and weakness of a program.

For several years there has been an interest in integrating all disciplines in vocational education into a single course or courses for all students interested in vocational education. Using the experimental design, Agan (1968) developed a project in Paola, Kansas where two courses, "Commonalities in Occupations"

and "Experiences in Occupations", were offered to juniors and seniors. Interviewed by the author of this study December '73 in Texas, Agan commented that although successful in the testing, the particular experimental design of the program did not last. The reason given was the interest in integrating the disciplines in vocational education was weak.

3. Procedures of Determining the Program or Curriculum Content in Secondary Agricultural Education

Review of research in agricultural education indicates the reshaping and updating of education is traditionally motivated by research (Hamlin and Deyoe, 1950; Sledge, 1960). The generally accepted principle of research was that program and curriculum should be based on and derived from the needs, problems, and aspirations of local communities. So much of the research pertaining to program and curriculum development was conducted in local communities for the specific purpose of devising curricula applicable to particular localities. For example, Beam (1961) studied the relationship between socio-economic trends and programs of vocational education in agriculture in North Carolina. He concluded that these trends were increasing the importance of local planning as a major characteristic of effective programs of secondary agricultural education.

In recent years emphasis continues to be focused on the study and investigation of the needs and problems of local communities as a basis for program and curriculum planning. A few examples of such

research follow: Adams (1970) identified the need for cooperative occupational experience programs in the Kennewick school district of Washington, and Brenner (1970) studied the curricular interests of forty two boys enrolled in the vocational agricultural program in the Ness City High School of Kansas.

From surveyed needs, problems, and aspirations, agricultural educators draft the program objectives. In their final report of a survey throughout the United States, the Council of the Great City Schools (1970) emphasized that the objectives in the curriculum in agricultural education must be identified and desired of the students when they had completed a particular course of instruction. They must be stated in specific operational terms and include goals aiming at the development of individual attitudes toward work, habits of work, and standards of excellence.

Once the objectives are determined, the content of the program or curriculum is selected. Review of research indicates five main procedures have been used in secondary agricultural education: the judgmental procedure, the experimental procedure, the analytical procedure, the consensual procedure, and the clustering procedure.

a. The Judgmental Procedure

This procedure is widely used by the curriculum worker.

The steps are: (1) identify the educational and social objectives that should be accepted; (2) determine the conditions under which

these objectives are considered desirable and in which they must be realized; and (3) select the subject matter that best satisfies those objectives under existing conditions (Thompson, 1973).

This procedure places great demands for intellectual honesty upon the curriculum or program planner. His judgment has to be from a broad perspective to avoid bias. Smith (1957) indicated that if his social perspective is narrow, and his ideas and prejudice are too little affected by democratic ideals and too closely identified with the interests of special groups, or if he is so occupied with the past that he cannot appreciate the present nor see its potential for the future, his judgment will hardly lead to the best choice of subject matter.

b. The Experimental Procedure

The experimental design is a procedure currently popular in agricultural program planning. This procedure moves one step beyond the judgmental approach. It determines the content by actual field trial or pilot test whether the program or curriculum satisfies a particular criterion. The criteria may be: Is the subject matter interesting? Does it meet the needs?, Do students learn?, Do students' parents like it? and Do workers get jobs? Field tests are as rigorous and as controlled as possible.

c. The Analytical Procedure

This procedure is widely used by researchers as the primary procedure for determining curriculum content in agricultural education. Basically this procedure has been that of occupational analysis developed by vocational educators during their participation in World War I training programs. It is an attempt to identify the abilities and understandings needed by workers in occupations involving a knowledge of agriculture. Smith (1957, p. 162) indicated that data were gathered by one or more of six techniques--interviewing, working on the job, analysis by the worker, questionnaire, documentary analysis, and observation of the worker.

In agricultural education, the technique of job analysis through observation by the investigator has not been used extensively. The interview technique is considered superior to the mailed questionnaire since some of the problems of interpretation of items in the instrument can be avoided when interviews are used. Another pattern of the analytical procedure in agricultural education has involved the use of experts to develop a list of competencies after which the list is subjected to workers in the field.

The analytical procedure has its own weaknesses. It is rare that a reliability coefficient of the instruments used for

collecting data is reported. An example is that if the review of research includes studies prior to 1966, Courtney (1962) was the only investigator who did it. The validity of the instruments, usually difficult to ascertain, is assumed to be enhanced when recognized experts in the job or industry being investigated are consulted in the preparation of the instruments. Another weakness of the procedure is that a random selection of persons, business firms, or jobs about which information is obtained for program or curriculum planning does not seem to be the most appropriate method of selecting the elements of the situation to be studied. When subjects are selected at random, the assumption is made that the determined competencies are needed by a well trained labor force. Such an assumption is not valid in all cases. The last weakness of the procedure is that it obviously cannot prepare the trainee for future changes in his occupation.

d. The Consensual Procedure

The consensual procedure is a way of collecting people's opinion about what they believe the program or curriculum should have. A jury of experts is chosen. The experts may be professional people, community leaders, leaders of agricultural industries, or any other group whose position, education, or background gives them more specialized knowledge than that of the average person.

The choice of the jury is determined by collecting their opinion through questionnaires, interviews, or group conferences. The final stage is the tabulation and interpretation of the responses.

Coupland (1962) used the consensual procedure to identify units of content essential to a program of instruction in agriculture and to develop a guide for the selection of agricultural content for programs or curricula in secondary agricultural education. When compared to the studies which utilized an analytical procedure, the consensual procedure is found inadequate.

c. The Clustering Procedure

With a diversity of occupational objectives at the secondary educational level, vocational educators reasoned that some way had to be found to meet these individual needs. They sought ways of grouping specific occupations and decided that the solution is either to build a core program, or curriculum, or to determine the similarities and differences through statistical analysis in order to be able to cluster the competencies.

Core Curriculum. - In this type of clustering procedure, agricultural educators try to identify a core of content which is applicable to both the farm and non-farm occupations involving knowledge and skills in agriculture.

Courtney and Coster (1963) and Binkley (1966) reported that the basis for program or curriculum content planning in agricultural education is the core of abilities required for

for farming. They maintained that the starting point is the identification of abilities required for farming. The next step is the identification and application of these abilities to occupations other than farming. Their point of view has influenced later research pertaining to program and curriculum development. Following their studies, most investigations have employed techniques of analysis designed to identify common elements between farming and non-farming occupations, or to determine the common elements among the various jobs within non-farm agriculturally oriented business.

Researchers at Mississippi State University (1972) indicated a core curriculum is needed at the elementary, junior high, senior high and post secondary levels. These curricula aim toward career awareness in agriculture at the junior high, and toward vocational and technical training at the post secondary level. They serve as important components of any school system curriculum and implement the new career education concept in agricultural education. However, a core curriculum is not always welcomed by the teachers. Lucas (1970) indicated that older teachers and teachers with more experience tended to adopt the core curriculum or program suggestions more readily. Teacher age, educational level and experience were found to have an influence on the degree

of agreement with the core curriculum.

Other Clustering Approaches. - Other clustering approaches use the factor analysis or the analysis of variance to identify the common and differentiated competencies and activities. A few examples of these approaches follow:

Fiscus (1965) and Dillon (1965) used the analysis of variance to determine the common and differentiated competencies in farming, in grain elevator business, and in agricultural equipment businesses.

Hoover, McClay and Stevens (1966), Ackley (1968) and Alhasmimi (1970) were examples of researchers identifying clusters of occupations and clusters of competencies through the use of the factor analysis method.

Results of studies using the technique of analysis of variance indicate that the procedure accentuates differences but is inadequate for identifying the common components among the various occupations. In each case the investigator has to resort to more descriptive statistics, mean scores or proportion of responses, as a basis for recommending the program or curriculum content.

Value of the Clustering Procedure. - In spite of the above weakness of the procedure, the clustering approach seems to be appropriate in the present technologically developed

society. Studying clusters of tasks performed by Washington, State farm operators, Long (1968) indicated that the high school program should be kept broad to encompass the breadth and complexity of agricultural production and agricultural business. Surveying two-year technical education curricula in agriculture and natural resources in the United States in the two periods 1966 - 67 and 1967 - 68, Manley (1969) indicated that such a curriculum must prepare for a cluster of closely related occupations rather than for a single job. The study data of Horner et al. (1970) also lent support for the planning of broad based vocational courses, where persons with a variety of job titles could be educated together in the basic concepts required by workers employed in their particular job. Sherman (1971) found that only a minority of agricultural educators maintained that a curriculum should be preparation for a specific agricultural occupation instead of one for clusters of related technical occupations. He indicated that students who completed a curriculum with very specific objectives found it quite difficult to change jobs because of their lack of broadly based entry skills and knowledge. Lee (1970) pointed out, however, that instruction similarities were only in certain areas in the secondary agricultural educational program, and that

teachers usually approached the cluster concept with caution. They didn't go into high skill jobs because there was not enough information on occupational analysis performed on each occupation.

4. Agricultural Teacher Education Programs

There are very few studies in procedures of planning programs or curricula in both pre-service and in-service agricultural teacher education.

a. Pre-Service Agricultural Teacher Education

Most research in pre-service agricultural teacher education programs was designed for evaluation to improve existing program content. A few examples follow:

Kelly (1968) tried to evaluate the pre-service agricultural teacher educational program in terms of competencies needed by teachers of vocational agriculture. Results indicated that competencies must be developed for the areas of general education, professional education, agricultural economics, farm management, agronomy, animal science, and agricultural mechanics.

Blankenshift (1968) used questionnaires and scholastic reports to determine the occupational statuses of graduates in agricultural education and to determine the graduates' evaluation of courses completed in the undergraduate curriculum. Student teaching was considered the most valuable course in teacher training. Relating

also to the value of student teaching, Wiggins (1968) investigated this learning experience to determine whether it caused significant change in the attitude of student teachers toward participation in the Future Farmers of America activities. Results pointed out the importance of carefully selecting cooperating and supervising teachers.

In addition to the above evaluation research in program content, there are also studies on the general characteristics of the pre-service teacher training program.

Boucher (1971) tried to determine how agricultural teachers were prepared. Findings indicate: (1) predominantly, departments of agricultural education were housed in the college of education; (2) fifty-eight of the 78 schools surveyed were on the semester system, (3) generally, the requirement for technical agriculture was 60 - 80 quarter hours (45 - 60 semester hours). The requirement for student teaching averaged 12 quarter credit hours (7.1/2 semester hours).

Martin (1971) found that the most important role items in current teacher education seen by teacher educators, vocational agricultural teachers, supervisors, principals, and the superintendent were: technical agriculture, professional education, program flexibility, student teaching and professional internship job placement and organization. The least important were: selection and recruitment of candidates, general education, state

program and certification, cooperative personnel and agencies, and assessment of first year teaching.

b. In-Service Agricultural Teacher Education

Most research dealt with the determination of competencies needed by vocational agricultural instructors in teaching a certain technical field. Very little has a functional value about program planning. A few examples follow:

Ellis (1968) conducted a study to determine how teacher educators and state supervisors in vocational agriculture can become more effective in the implementation of behavioral change among teachers of agriculture. Findings indicate they would be more effective by identifying and associating with opinion leaders and becoming aware of sources of information which teachers of agriculture use in the adoption of educational innovations.

Hemp (1966) attempted to determine the effectiveness of summer institutes or workshops as a means of developing effective curriculum materials and in upgrading teachers in service. Findings indicate that workshops are generally effective.

Agricultural Education in
the Developing Countries Neighboring to South Vietnam

1. Agricultural Education Programs

With the alarming estimates of world food shortage and possible

famines at present time as well as within the next decades, attention has turned to agricultural education as a way to promote production and to alleviate the crisis.

Swanson (1969, p. 73) reported that advanced countries have relied heavily on secondary level school oriented agricultural training programs to meet their development objectives; meanwhile less developed countries have relied mainly on the extension service and university level agricultural training program.

Most countries neighboring to Vietnam, however, have usually given equal, if not more, importance to secondary agricultural education as to agricultural extension and university level agricultural training program. This fact was found by the author of this study in his visit to Singapore, Malaysia and Thailand and his contact and exchange of ideas with Japanese, Taiwanese or Philippine agricultural experts or educators visiting South Vietnam. The often heard and generally accepted reasons were: more skilled workers and technicians are needed than college graduates to develop the country rapidly; and older farmers are less apt to change than younger people.

Review of research reported in agricultural education in the developing countries neighboring Vietnam indicate that importance is being given to secondary agricultural education.

Kao (1965) indicated that the agricultural education program was

was one of the factors that caused an average growth rate of four to nine percent per year in agricultural production in Taiwan during the post-war period 1952 - 62.

Freeman (1965) studied the role of the agricultural education program in Thailand. He found documents revealing that educators and economists recognized the importance of such education in the economic development of the country.

Sacay (1931) indicated that the Philippines is essentially an agricultural country, that the development of agricultural resources was essential to the welfare of the people, and that there was a great need for agricultural education. De la Cruz (1964) pointed out that Philippine national income had to be increased through improvements in agricultural productivity. His study pointed out the necessity to correct several deficiencies in the Philippine agricultural training program.

Not all developing countries in South East Asia share the same understanding of the importance of the secondary agricultural education program; Hudli (1958) found that historically India had not given much support and recognition to agricultural education. Shah (1971) indicated that in 1971 India still lacked a comprehensive plan for secondary agricultural education.

Several studies focused their attention on what and how long the agricultural education programs and curricula should be.

Malassis' study (1966) seems to have a great impact on agricultural education in developing countries. Malassis suggested that the program must emphasize general economic principles, that rural education development must go hand in hand with the rural economic development, and, that in the process of planning, rural development and education must be integral. He emphasized the need for an intellectual investment at the secondary agricultural education level in order to achieve national economic development goals.

Meaders (1965) indicated that the successful Taiwanese program is a five-year program consisting of a junior and a senior vocational agricultural curriculum. The first curriculum is comprehensive while the second is specialized. Yuan (1967) pointed out that Taiwanese agricultural education programs were provided in both secondary and post-secondary schools.

Hudli (1958) recommended that India offer a four-year secondary agricultural education curriculum as part of the total educational program for students preparing to enter agricultural occupations. He underlined that youth and adult farmer programs should be conducted under the sponsorship of the school and be considered as essential phases of the total secondary agricultural education program.

Teshna (1968) indicated that in Thailand special education in agriculture offered in the farm settlement program and the pilot projects of integrating agriculture into academic high school curri-

culum seemed very promising.

The Department of Education in the Philippines (1959) described two agricultural educational programs--the settlement farm school program and the four year agricultural educational program. The first program aimed to encourage native backward people to come down from the hills and take up permanent residence in the lowlands where they may earn a living by tilling the soil while the second program was to prepare the youth and adults for agriculture. In addition to the secondary level, the Philippines had a post-secondary technical level program to supply trained personnel who in turn would work with other youth and adults or pursue agricultural occupations.

Other research focused on the objectives.

Mollar (1958) indicated that: (1) the Philippine program was designed to assist in the development and utilization of agricultural resources; (2) it was flexible, functional, and practical; (3) it served both students preparing for farming and those preparing for college; (4) it provided for training in production, processing, and marketing of agricultural products; and (5) it provided for training in leadership, community improvement, conservation of natural resources and the dignity of labor.

Teshna (1968) found there was a discrepancy between Thai student goals and educational goals set at the national level.

Yuan (1967) pointed out that the main objective of Taiwanese

agricultural education was to develop and enrich rural life by acquainting future farmers with modern farming methods and better agricultural techniques.

Review of research indicates a general agreement on the value of the Future Farmers Association as a part of the secondary agricultural education program.

Hudli (1958) recommended that the Future Farmers of India be started. Shah (1971) emphasized that this youth activity should be considered in the evaluation of the student's year-round performance. Mollar (1958) indicated that all Philippine students in the secondary agricultural educational program were members of the Future Farmers of the Philippines.

Some other findings found in research in secondary agricultural education deserving attention are: great emphasis has been and is recommended to be put in the Philippine secondary agricultural educational program (Mollar, 1958; De la Cruz, 1964). De la Cruz (1964) recommended that deficiencies in Philippine secondary agricultural education program be corrected as follows: (1) ways and means of carrying out the goals and objectives of the school should be agreed upon by the staff; (2) the administrator of the school and the school staff should cooperatively define the program; (3) a representative advisory council should be established to advise the administrator in the program formulation; (4) the recruitment and selection of the students should be a continuous process; and (5) the school should have

a placement program.

It should be pointed out that in South East Asia the administration of the agricultural educational program is centralized. Order goes from the top responsible authority of the nation or of the state down to the school. Yuan (1967) pointed out that the Taiwanese administrative organization of agricultural education follows the rule of centralization and that multiple laws and regulations limit the curricular offerings of the agricultural schools. The Department of Education of the Philippines (1959) indicated that the revised secondary agricultural program issued to the field as an enclosure to the Philippine Department of Education Memorandum No. 22, s. 1945, was the only curriculum being used in all regional and national agricultural and rural schools of the Philippines.

Such a centralized administration seems to help maintain quality in education. However, studies indicate that it needs improvement.

Freeman (1965) indicated that the effectiveness of Thai agricultural education programs would benefit from increased Department of Education coordination, with institutions employing graduates of agricultural schools, and from a decision in the Department that the major objective of the agricultural schools was to prepare students for agricultural careers.

Shah (1971) indicated that in India: strong administrative personnel in agricultural education for all levels was needed, and

vocational agricultural education for all levels should be administered at the state and the central levels through respective agricultural education boards which should be responsible to the Department of Education.

2. Agricultural Teacher Education Programs

With respect to agricultural teacher education programs and program planning in the developing countries neighboring to South Vietnam, research is scarce. The only reported studies are from the University of Philippines, Laguna, Philippines.

Alonzo (1959) evaluated the student teaching experience of Central Luzon Agricultural College elementary agricultural teachers. Findings indicated: (1) the student teacher should not take other courses while teaching; (2) the student teaching experience should last for one full semester; (3) student teachers should live in the community where the cooperating schools are located during the student teaching period; (4) cooperating teachers, school administrators, teacher trainers and others involved in the student teaching program should be brought together for a conference at least once a year in order to develop better understanding and closer working relationship; and (6) the student teaching program should be evaluated after each period of student teaching.

Solero (1965) indicated that students who choose to major in agricultural education in the University of Philippines are required

to have a grade point average of 2.5 or better. In addition to the grade requirement, the applicants are screened by a committee composed of staff members of the Department of Agricultural Education who examine the prospective teachers of agriculture with respect to his background farm experience, ability to communicate and other qualities of a good teacher of agriculture. Graduates are required to have completed a minimum of 152 semester credit hours. About twenty two percent of these are in technical education and another twenty two percent in basic sciences. Only 15 credit hours are devoted to math and physics. They are also required to complete four credits including English, Spanish and some basic Eastern and Western philosophies. The remainder is devoted to professional education which comprises about sixteen percent of the total requirements for graduation with the degree of Bachelor of Science of Agriculture with a major in agricultural education. The undergraduate training in professional education is a three-stage program. During the first stage, the student takes courses in elementary and educational psychology, methods of teaching agriculture, education tests and measurements, and a course in farm mechanics. The second phase is a six-week on-campus observation and practice teaching assignment while the third stage is an eight-week off-campus student teaching experience. In addition to the student teaching experience, agricultural education majors are required to present seminar papers and to write on a special problem in agricultural education.

Alonzo (1967) appraised the off-campus student teaching experience of the teacher education curriculum in agriculture of the Central Luzon State University. The following recommendations were made: (1) the duration of the student teaching program should be lengthened from eight weeks to one semester; (2) closer coordination between the cooperating schools and the training institution should be effected through seminars, workshops, etc..., held at least once a year; (3) aside from providing adequate facilities and references, the cooperating schools should furnish student teachers advance copies of the course of study, the schedule of classes, a tentative work program, teaching assignments, and their other responsibilities; (4) the training institution should furnish the cooperating schools cumulative records of their student teachers; (5) student teachers with previously prepared subjects should be barred from student teaching; (6) student teachers should be required to read cultural, educational, and scientific materials; and (7) participate in professional activities.

Summary

In summary, the review of literature through a historical perspective points out facts which help in the development of a model program in secondary agricultural education and in agricultural teacher training programs for South Vietnam.

1. From the United States

a. Program and Curriculum Planning in Secondary Agricultural Education

Four bases must be considered as guidance for decision making in program and curriculum planning: the social forces, the human development, the nature of learning and the nature of knowledge (Hass, 1974).

In general, five designs can be used: design focused on specific competencies, design focused on subject matter or discipline, design focused on social activities and problems, design focused on process skills, and design focused on individual needs and interests (Alexander, 1974).

Four types of programs and curriculum planning have been developed in secondary agricultural education: the traditional design, the integrated or cross sectioned design, the specialized course design, and the experimental design.

Five procedures have been used in the development of the program or curriculum content: the judgmental procedure, the experimental procedure, the analytical procedure, the consensual procedure, and the clustering procedure.

The general steps in program or curriculum planning in agricultural education are: to survey the needs, aspirations and problems of the students, to determine the objectives, and to

determine the program or curriculum content.

In the survey of needs, aspirations and problems of students, the bases of Hass had been considered. Al Salman (1965) emphasized awareness and exploration needs in the prevocational agricultural education. The Council of the Great City Schools (1970) indicated that objectives must aim at the development of individual attitudes toward work and habits of work. Beam (1964) emphasized the relationship between socio-economic trends and programs of vocational education in agriculture.

The planning designs and the programs, or curricula, in agricultural education fall in four of the five designs discussed by Alexander. The traditional and the integrated designs are focused on subject-matter discipline. The specialized design emphasizes the specific competencies. The experimental design focused either on subject matter or specific competencies. The prevocational program is a mixture of designs focusing on subject matter or discipline and on individual interests. The vocational program always focuses on individual interests and the community concept (social activities and problems in the community) in addition to the subject matter or specific competencies design it has embraced. The post-secondary technical program emphasizes the specific competencies in the content and the community concept in the objectives.

Thus programs and curricula in agricultural education at all levels (prevocational, vocational and technical) have had a multiple design approach as advised by Taba (1962) and Alexander (1974) more than a specific competencies design, also called a performance based design by Popham and Baker (1970).

In the determination of the program and curricula content, the most used methods at the present time in research are: the analytical, the experimental, and the clustering procedures (Thompson, 1973; Long, 1968; Manley, 1969; Horner, 1970). The widely used procedure by curriculum workers is, however, the judgmental procedure (Thompson, 1973). Caution should be taken when using the analysis of variance in the clustering procedure.

b. Agricultural Teacher Education Program

Six important role items in agricultural teacher education programs are: technical agriculture, professional education, program flexibility, student teaching and professional internship, job placement and organization (Martin, 1971).

Five least important role items are: selection and recruitment, general education, state program and certification, cooperative personnel and agencies, and assessment of first year teaching (Martin, 1971).

Generally the training program required 60 - 80 quarter hours (45 - 60 semester hours) in technical agriculture, and 12 quarter hours (7 1/2 semester hours) in student teaching (Martin, 1971).

2. From the Developing Countries Neighboring to South Vietnam

Agricultural education is found to be essential to the development of agricultural economies of Thailand (Freeman, 1965), Taiwan (Kao, 1965; Meaders, 1965), and Philippine (Sacay, 1931; De la Cruz, 1964).

Agricultural education must emphasize general economic principles. It must go hand in hand with rural economic development. It is in the secondary level of agricultural education where there must be an intellectual investment to achieve the national economic development goals (Malassis, 1966).

The organization of the program varies with the country. Taiwan offers a five-year program including both a comprehensive and a specialized curricula (Yuan, 1967). A four-year curriculum in secondary agricultural education is suggested for India (Hudli, 1958). The Philippines offer: short-term training for backward, prospective farmers; a four-year curriculum in agricultural high schools; and a technical curriculum to train extension workers and technicians in agribusiness (Department of Education, Philippines, 1959).

The objectives, although stated and defined differently, are always concentrating on: agricultural competencies for entry and advancement in agricultural production and in non-farm agricultural occupations and abilities needed to exercise and follow effective leadership.

The agricultural education program needs flexibility (Yuan, 1967; Department of Education, Philippines, 1959). The Future Farmers Organization and the Supervized Experiences are highly praised or recommended (Hudli, 1958; Shah, 1971; Mollar, 1958). It is recommended that there be more cooperative efforts among administrators, agricultural educators and advisory committees in drafting the curricula (De la Cruz, 1964; Shah, 1971; Freeman, 1965).

With respect to teacher training, student teaching is highly recommended (Alonzo, 1959; Alonzo, 1967). Emphasis is put on high school achievement and farming background in the selection of students to become agricultural teachers (Solero, 1965). Programs of teacher training consists of 152 semester hours in which twenty two percent is devoted to technical education, twenty two percent to basic sciences and sixteen percent to professional education (Solero, 1965). Closer coordination and cooperation of work are recommended between the cooperating schools and the training institutions (Alonzo, 1967).

CHAPTER III

FINDINGS AND INTERPRETATIONS

Potential of Agriculture in the South Vietnamese Economy

1. Physical Features and Climate of South Vietnam

South Vietnam, like California, is long and narrow. However, it is about the size of Missouri, consisting of about 17,324,300 hectares with a population of more than 17 million. It is located on the eastern and southern portion of the Indochinese Peninsula in South East Asia, with coastlines on the South China Sea and the Gulf of Siam. Neighboring countries include Laos, Cambodia and Thailand to the west, the Communist or Democratic Republic of Vietnam to the north. (See map p. 230).

Lying between the ninth and the seventeenth parallels North of the Equator, South Vietnam forms the lower half part of the letter "S", the shape of the whole former Vietnam. Going from the North to the South, South Vietnam has a long undulating coast with small fertile plains interspersed by rocky prominences jutting out to the sea -- this thin coastal strip widens and eventually slopes into the rich alluvial soil of the Mekong Delta farther South. Inland, the mountain ridges running down to the spine of the peninsula merge into the Truong Son or Annamite Chain which descends into a series of plateaus in the West.

South Vietnam is a country with four well defined regions based upon soil, climate and topography with their relation to agricultural potential: the Mekong Delta, the Eastern Region, the Central Coastal Lowlands and the Central Highlands.

The Mekong Delta extends from the Cambodian border to the South China Sea, and from about forty miles south of Saigon to the Gulf of Siam. It is heavily populated and characterized by alluvial soils and small farms. It is the principal rice growing area of the nation.

The Eastern Region lies between the Mekong Delta and the Central Highlands. Composed mainly of the deltas of the Saigon and the Dong Nai Rivers, it has large swine operations and rubber plantations.

The Central Coastal Lowlands lies along the coast of the South China Sea north of the Eastern Region and east of the Central Highlands. This is the poorest agricultural section of South Vietnam. The soil is low in nutrients. Rice is extensively planted. Sugarcane and tobacco are the only important products of the area.

The Central Highlands are the mountainous portions of South Vietnam and are mostly covered by forests, tea and coffee plantations.

Due to its shape and location, South Vietnam is bathed by the monsoon for six months. During this period it is hot and wet. The remainder of the year is hot and dry. However, because of the long shape and various altitudes in the country, the four above regions do not have the same climate. The Mekong Delta has little variation in temperature during the year (25° C in December to 20° C in April). Its average rainfall is about 1900 millimeters (75 inches). The Eastern Region, higher in altitude than the Mekong River (100 - 200

meters), has a lower temperature and a higher rainfall of about 2200 millimeters (86 inches). The Central Coastal Lowlands have widely varying temperature and rainfall due to the variations in latitude and the direction of monsoon storm. The Central Highlands have cooler temperatures and a heavier rainfall than the other parts of the country.

Low in nutrients and widely distributed, the soils of South Vietnam are somewhat grouped in the four regions named above. The main agricultural soils are: alluvial soils, gray podzols, red yellow podzols, and latosols (Thai Cong Tung, 1971, pp. 29 - 41).

Covering the entire Delta Region and occurring in the river valleys of the narrow Coastal Lowlands are the alluvial soils. This area is flooded half of the year and is well suited to rice production, but unsuitable for extensive livestock production, forestry and most plantation crops. However, orchards are being extended by the construction of terraces or elevated rows.

Dry, erodable and low in nutrients, the gray podzolic soils are found on old alluvial sediments, particularly in the Eastern Region. They are suitable for the growth of perennial plants having deep roots, such as rubber, mango trees and jack fruits.

Intermixed with the gray podzolic soils, the red-yellow podzolic soils develop mostly from transported terrace materials. The soils are usually better from a fertility standpoint than the podzolic soils because the clay layers are closer to the soil's surface; thus, they are suitable for the cultivation of annual plants such as cassava and peanuts.

Most of the latosols have a crumb structure, excellent physical

condition and are resistant to erosion. Derived from weathered basalt, the Reddish Brown Latosols of the Eastern Region provide deep and fertile soil suitable for cropping. The soils of the Central Highlands are highly prized for production of rubber, tea and coffee. The Red Latosols and the Earthy Red Latosols of the Central Highlands, having a low water holding capacity, are frequently used for tea production.

All the soils of South Vietnam have been well studied and mapped. They are low in nutrients and erodable but most soils respond to proper applications of fertilizer.

In short, the physical features, climate and soils of South Vietnam indicate that the country's geographical characteristics are propitious to agricultural development. Such a development, however, requires that programs of Agricultural Education take into consideration the local variation of soils and climate in its program content.

2. Agriculture in the Economy of South Vietnam

Agriculture is the most important sector of South Vietnam's economy. It is estimated that 70 to 80 percent of her work force is currently involved directly in the production of crops, animal products and fishery. There are about two million farm units and over 250,000 fishermen in South Vietnam.

Agriculture has been the principal source of exchange. Agricultural products have constituted 90 - 95 percent of the value of all exports. Rice and rubber have been the major export commodities although since 1964 exports of rice have been deleted. In recent years the agricultural sector of Vietnam has been contributing about one third of the total national income of the country.

However, South Vietnam is experiencing a shortage of agricultural products. Prices of agricultural products as a whole have nearly tripled since 1964. The agricultural price index for 1967 was 410.3 (1957-1959=100) compared with 145.6 in 1965. The index for plant products advanced to 389.6 but animal products moved up even more rapidly to 465.3 (Vu Quoc Thuc et al., 1969, 3:171). The overall production has been almost stagnant during the past thirteen years and has not improved much over the 1959 - 1961 level. Agricultural prices would advance even more rapidly if the government of South Vietnam was not engaged in certain price control activities.

The major causative factor of price increases has been the lack of security, or peace, in the countryside. But when peace comes, a new thrust in agricultural production will certainly occur. Agricultural education, an important factor in the agricultural development of countries neighboring to Vietnam (Kao, 1965; Meaders, 1965; Freeman, 1965; Sacay, 1931), must go along with rural economic development (Malassis, 1966). Thus, it is necessary to look at: (1) the status of the agricultural sector in South Vietnam's economy; (2) the prospective needs for agricultural products in South Vietnam; and (3) the prospective agricultural production and its implication in an agricultural education program.

a. Agricultural Status of South Vietnam

The present agricultural situation of South Vietnam can be through an analysis of the major products or groups of products that make up the bulk of the nation's agriculture.

Rice. - If one considers only food, fiber and oil crops, then rice occupies the largest acreage among the cultivated crops in South Vietnam. It is the most important food crop and was exported in great quantities until 1964. It accounted then for more than 15 percent of South Vietnam's foreign exchange earnings. Today it accounts for 35 to 40 percent of the total value of South Vietnam's agricultural production, including livestock, fish, sea products, and forestry.

War, however, has created a shortage of farm labor and displaced many agricultural workers. The production of rice has fallen from an average of five million tons during the period 1960 - 1964 to 4,668,400 tons in 1967 - 1968. By 1967 imports totalled 749,000 tons (AESS, 1969).

From a low acreage of 2.2 million hectares in 1966, the acreage planted with rice steadily climbed up to 2.6 million hectares in the 1971 - 1972 crop year. That planted acreage, however, was the same as the previous high in 1964 - 1965 (AESS, 1970). While rice production increased by 15 percent in the last decade, South Vietnamese population gained about a third; far outstripping the production gains. Substantial imports were needed to maintain reasonable price levels and totalled nearly 300,000 tons in 1972 (USDA, 1973-a).

Rice yields reached more than 2,400 kilograms per hectare in the 1971 - 72 crop year. The Delta yields increased

nearly 30 percent from a 1968 low, while yields in the other regions jumped nearly 40 percent in the same period. Much of the gain springs from the rapid expansion of improved high yielding improved rice (IR) varieties and additional hectares planted (40,000 in 1968 - 1969 to 674,000 in 1971 - 1972, USDA, 1973-a). The share of total hectares planted to IR varieties has increased around 2 percent in 1968 - 1969 to more than 25 percent in 1971 - 72. IR varieties have been a major force improving overall paddy yields in recent years. Improved rice production, however, requires good technical knowledge; that is, qualified farmers must be trained.

Rubber. - Rubber production has suffered more than rice from war destruction. Battles have taken place on many rubber plantations. The shortage of labor and the lack of care of the trees reduced the yield sharply. Exports of rubber from 1955 to 1964 averaged more than 70,000 tons, but had fallen to about 38,000 in 1967. Total production of rubber increased from the 1969 low of 27,650 tons to 57,000 tons in 1971, the highest level since 1967. This resulted in the export of 29,000 tons of rubber worth \$9.4 million at the FOB Saigon value of \$.3172/kg. This dollar value of exports is slightly lower than the 10.4 million rubber export of 1969 despite the increase in production. This reduced value was due to increased domestic use and decline of the export price.

Production increased from the previous year's level in 1970 and again in 1971. This was due to increase in the tappable area (from 48 percent in 1969 to 60 percent in 1971) and in a slightly higher yield per tapped area (934 kg/ha in 1971). Tappable area increased because previously planted trees began to produce (AESS, 1969; AESS, 1970).

Tea. - Tea production in 1967 was about the same as in 1962, (4,500 tons) although the plantation area has decreased from 9,350 hectares (1962) down to 7,500 hectares (1967). Exports were down almost 50 percent. No study has been made since 1967 but it has been estimated that the situation has remained constant (Vu Quoc Thuc et al., 1969).

Other Crops. - The overall production of other crops, substantially all of which are used in the country, remain more or less the same with a few exceptions. Vegetable production has increased from about 133,000 tons in 1965 to 192,000 tons in 1967 while the production of sugar cane has decreased significantly from one million tons in 1965 to 770,000 tons in 1967.

Livestock. - Lack of production data limits analysis of the livestock sector. Analysis, therefore, relies heavily on reported inventory numbers and data on controlled slaughtered animals.

The present livestock of South Vietnam and its distribution in thousands is indicated in Table I. (Thai Cong Tung, 1971, p. 58):

TABLE I
Distribution of Livestock in South Vietnam

	Buffalo	Cattle	Pigs	Chicken	Ducks
Mekong Delta	316	294	2,124	12,669	10,947
Eastern Region	114	105	562	3,000	1,586
Central Coastal Lowlands	167	489	971	4,000	1,540
Central Highlands	29	51	114	381	29
Total	626	940	3,771	20,050	14,102

Although controlled slaughtered stock averaged just over 1.0 million head for the 1960 to 1970 period, total production has been increasing. Estimates based largely on inventory numbers and assumed increases in breeding stock, indicate that total pork production has apparently increased from 8 to 10 percent annually in recent years (USDA, 1973-a).

Data on chicken production are even more fragmentary than those for hogs. With increases in poultry breeding stock, as well as broiler stock, there have been substantial increases in poultry production in recent years. With a total of 9,627,000 head in 1960, the chicken population increased to 20 million head in 1962 and has remained rather constant since (USDA, 1973-a).

Fish. - The catch of fish and other seafoods rose from 52,000 metric tons in 1957 to 588,000 metric tons in 1971. Except for small decreases in 1965 and 1968, production has increased each year since 1960. Production jumped dramatically in the

1969 to 1970 period with the catch up nearly 25 percent.

Much of the recent increase can be attributed to an aggressive expansion in the number of fishing boats, which increased by more than 50 percent in the 1963 to 1970 period (USDA, 1973-a).

Forestry. - About 5,620,000 hectares (32 percent of the land area of South Vietnam) are classified as forest and can be divided into the following categories:

open forest	5,015,000 hectares
coniferous forest	
three needle pine	90,000 hectares (Pinus Khasya)
two needle pine	35,000 hectares (Pinus Merkusii)
flooded forest	
mangrove	280,000 hectares
rear mangrove	
plant	200,000 hectares (Mela Leuca leuca-dendron)

These forests have 1500 woody species, from which less than a tenth are classified for commercial use, and about 30 species are in high commercial demand including valuable rosewood (Dalbergia and Pterocarpus) and several species of Hopea, Chorea and Dipterocarpus (University of Florida Team, 1967).

For the last two decades, however, there has been no timber resource survey. It is known that during World War II the Japanese destroyed about 50,000 hectares of forests. Large forest areas have been cleared by the Communists and the government military forces to support a war economy, to resettle war refugees, and to prevent enemy ambushes or cover for the enemy. According to a report of E. W. Pfeiffer to

AAAS in 1967, half of the mangrove forests of the Mekong Delta have been permanently destroyed and one fifth of the hardwood forests damaged (Hayden, 1972).

Yet the Directorate of Forestry, Republic of Vietnam, reported that: (1) in 1970, 47,358 cubic metric of pine had been used as construction wood; (2) in 1971, 52,706 cubic meters of pine had been used in construction work; 9,228 cubic meters of pine had been exported bringing in 267,612 US dollars; (3) in 1972 (the first quarter) 21,407 cubic meters of pine had been exported bringing 620,803 US dollars; and (4) the timber and wood production of the open forest amounted to:

Controlled production

286,570	cubic meters in 1968
462,722	1969
405,526	1970
656,647	1971

Uncontrolled production

350,000 to 700,000 cubic meters per year.

b. Prospective Needs for Agricultural Products

In looking forward over the period of 1974-- 1984 it is impossible to forecast with any real accuracy or in detail the probable prospects for agricultural products in South Vietnam. Despite the limitations some attempts have been made.

Vu Quoc Thuc, et al., (1969, pp. 180 - 196) gave an estimate based for the most part on the highest level of per capita disappearance of agricultural products in 1962-67. Disappearance includes consumption amounts used for seed, lost through spoilage, damage by rodents and insects, etc. Based on this

projection alone, production over the period 1970 - 1990 would exceed the 1967 output by 150 percent for crops, 120 percent for livestock and 90 percent for fish.

Commenting on the needs for exports, Vu Quoc Thuc et al., indicated that (1) North Vietnam, historically a market for rice to the South, was approaching self-sufficiency; (2) for some time to come it is likely that India, Indonesia, and possibly Japan would be buying quantities of rice; (3) Malaysia, Singapore, Hong Kong and Ceylon were also potential markets for rice. The complication, however, was the probability that all rice producing countries would be increasing their productivity (even Japan had a surplus in 1969) with currently unpredictable impact on the world market. Vu Quoc Thuc et al., indicated that there was no doubt that South Vietnam would be able to export rice after the war; in fact, they predicted an export of 2.5 million tons in 1990.

Vu Quoc Thuc et al., also pointed out that the future of rubber as an export crop was obscured by (1) the international market situation in which synthetic rubber is an increasingly serious competitor; and (2) the downward trend in prices for several years. An output of 100,000 tons of rubber, according to Vu Quoc Thuc et al., by 1990 is not unduly high.

It is probably as indicated by Vu Quoc Thuc et al., that despite its increasingly serious competitive problem, tea would continue to be an important export item along with specialty products such as duck feathers, duck eggs, spices (including cinnamon), and medicine plants. There may be an opportunity to

significantly increase the exports of peanuts, copra and processed cassava during the next twenty years.

Another evaluation of the prospective needs for agricultural products has been done through a study in 1971 by the National Institute of Statistics, Republic of Vietnam, on the demand for household expenditures. These demand analyses attempted to identify and measure forces influencing purchases of food consumers. Data indicated that for staple foods such as cereal and cereal products (mainly rice), fish, vegetables and oils, per capita expenditures continued to rise for each higher household expenditure group. The rise was not as pronounced as they were for such foods as poultry, pork, beef, fruits and others high in the consumer preference ranking.

Based on the same study, a joint USDA - Department of Agriculture of South Vietnam team worked out projections for demands in 1967. Per capita food expenditure gains in price of around 15 percent or more were indicated for poultry, red meats, fresh fruit, sugar products, soft drinks, alcoholic beverages, and eating out. Smallest gains relative to the projected 15 percent increase in per capita total expenditures were indicated for cereals, fish, fresh vegetables and edible oils. Although these changes may be due to income growth, the projections were indicators of probable demand of agricultural products in the next decade (USDA, 1973-a, pp. 128 - 145).

Appraisal of the prospective expansion in domestic markets for food gives only a part of the prospective need for agri-

cultural products. To survive South Vietnam must export products to gain foreign exchange. The same joint USDA - Department of Agriculture of South Vietnam team looked into the prospects of agricultural products in nearby markets.

According to this team, prospects were good for Vietnamese exports of food to her traditional nearby markets. South Vietnam is close to several countries with large urban populations. Per capita income within these large urban areas are sufficient to demand a much greater quantity of agricultural raw materials and food products than can be produced nationally because of limited agricultural land. The increasing demand for more food and fiber in these nearby markets provides excellent opportunities for Vietnamese products.

In 1970, five nearby countries (Hong Kong, Japan, Singapore, Republic of Korea, and Taiwan) imported over \$6 million (US dollars) worth of raw materials and food products, excluding fish and forest products. This was double the value imported in 1960. Approximately 66 percent of the combined market is cereal grains, fruits, vegetables, natural fibers and oil seeds (USDA, 1973-a).

Since 1960, the value of Hong Kong's agricultural imports has doubled while Japan's increased about 2.5 times; Taiwan's were up 3.5 times; and Korea's were 5 times larger. The total value of Singapore's imports of agricultural products, since 1960, has declined due to smaller rubber imports from Malaysia; but, substantially large amounts of fruits, vegetables, meats, animal feeds, and animal and vegetable oils and fats were imported.

Looking into the world demand for rice, coarse grains, oil seeds, and rubber, the following synthesis can be made from a series of studies published in 1971 by the USDA (Rojko et al., 1971; Moe et al., 1971; Regier et al., 1971) and the FAO (Food and Agricultural Organization, 1971). The studies indicated where agricultural production should be emphasized, i.e., what course content should be included in the program.

Rice. - If the green revolution is successful, and/or if the population growth is reasonably restrained in the large rice consuming countries, the world rice trade will be poor. This is due to lower world import demand, a demand traditionally centered in less developed countries. Import demand in the developed areas is expected to rise moderately but the increase will be small relative to potential exportable supplies.

The impact of reduced import demand in the less developed countries would center around the traditional rice suppliers, primarily in Southeast Asia. However, given the "thin" nature of world rice trade, any prolonged slow down of the green revolution in rice, particularly in South Asia and East Asia, could have a serious impact on import demand for rice. While the general situation may tend towards lower prices in real terms, rice trade and prices in a given year could be quite volatile because of short events. For instance 1972.- 73 world import requirements were unusually high because of adverse developments in the Philippines, India, Thailand,

Indonesia, Bangladesh, South Korea, as well as in South Vietnam.

Coarse Grains. - The world market for coarse grains through the 1970's is expected to grow more than the market for rice. However, coarse grain prices in terms of real prices are not expected to be significantly higher than they were in the last decade. Production potential for all grain would remain larger than demand at current prices, although a strong and growing demand for livestock and livestock products in Japan and other major importing countries will expand the market.

Shifts toward self-sufficiency, such as is expected from the enlargement of the European community, would reduce world import demand. On the other hand, the world grain market would be strengthened if the USSR continues its current policy of importing grains. Therefore, markets for South Vietnam's corn or sorghum will depend heavily on competitive prices and any special bilateral arrangement with importing countries. Competition from major exporting countries will remain great.

Oilseed. - The demand for high protein oil-cakes is projected to increase as fast or faster than supply. However, supplies of oil associated with meal production are projected to increase faster than demand. The net effect of these two opposing trends is that prices for the individual oilseeds are likely to move in accordance with the relative values of

both the meal and oil components. Thus, price prospects remain high for oilseeds with a high valued meal component (e.g., soybeans). Conversely, prospects are actively less attractive for oilseeds with a low meal value (e.g., oil palm).

Rubber. - The future of natural rubber depends on its competitive position relative to synthetic rubber. Recent developments are mostly favorable to natural rubber. Potential per unit area has been greatly increased with cross-breeding of high-yielding clones and introduction of the yield stimulant "compound Ethrel". These factors could reduce production costs 12 to 20 cents per pound. In addition, the Rubber Research Institute of Malaysia has developed a special tire rubber using natural latex which is being tested by major tire manufacturers. Tests indicate that the product is a better tire rubber with lower heat buildup as one of its attractive qualities.

Although synthetic rubber producers have improved the properties of their products, they are faced with increasing costs due to inflation and the increased price of oil--their major raw material. The FAO study indicated that the natural rubber demand would increase at a rate of 2.3 to 5.2 percent by 1980.

c. The Prospective Agricultural Production of South Vietnam and Implications for a Program of Agricultural Education

Information previously identified and discussed suggests the following regarding prospective agricultural production and

implications to a program of agricultural education for South Vietnam:

Soil. - Out of the total 17 million hectares in South Vietnam, only three million are planted to rice. The remaining hectarage consists of forests and poor soils. However, approximately two million of the 14 million hectares left do have agricultural potential. Cooke et al. (1962) indicated that although most of the South Vietnamese alluvial soils are now planted to rice, annual crops and fruit trees, the application of new techniques, plus water control, would increase yields. Only a part of the red soils of the Central Highlands and Eastern Region and the gray podzolic soils of the Eastern Region are under cultivation. Their use could be expanded in the post-war period. Estimates indicate that over 1 million hectares of this 1.9 million hectare area will be utilized by 1990. The organic soils of the U-Minh area (142,520 hectares) could also be used in the post-war period when water control is achieved.

Climate. - The climate of South Vietnam allows for year-round cultivation. Area-wise, it is variable enough to produce not only tropical crops but also sub-tropical and temperate crops in the highland areas.

The two factors (soil and climate) indicate an educational need for emphasis in soil characteristics, proper use of soil and the climate, depending on where the agricultural education program is implemented. Such factors must be considered when making decisions about the program content to be offered in

Agricultural Education.

Crop Production

Rice. - In spite of lower world demand, rice is by far the most important agricultural commodity in Vietnam. After the war, South Vietnam should be in a position to quickly attain the production level achieved before 1963 and produce sufficient quantities for export. This can be accomplished by (1) increasing the cultivated area of rice, (2) an intensive use of land such as planting two crops a year (which has been done in the delta and which can be done along the coastal areas of central Vietnam with the water control and know how), and by (3) increasing yields (with flood control and drainage, and by the use of improved rice varieties). In a recent visit to Florida (July 17, 1974) the Minister of Agriculture of South Vietnam reported that three crops a year have been successfully grown in the delta through increased control of water.

Other Annual Crops. - The South Vietnamese agricultural economy must not put emphasis on rice production alone. Taking advantage of the increased demand in oil seeds (e.g. soybean) and coarse grain, diversified cropping of annual crops will assume great importance in the post war years. With the greater need for animal protein, the livestock industry will require feeds such as corn, sorghum and leguminous forage crops. Peanuts and soybeans will provide oil, protein for humans and feeds for livestock. Vegetable

crop production has an almost unlimited potential in South Vietnam and practically all existent vegetables can be successfully grown in the country.

Production of the above crops would make it possible to expand the present processing capacity now devoted to these crops. This increased output will require more sugar factories, feed mills and oil extraction plants as well as big manufacturing and tobacco curing plants.

The production and processing of the above crops would create a need for emphasis in courses of instruction concerning production of annual field crops other than rice, of crop processing technology other than rice milling, and of oilseed production with a high value component.

Tree Crops.- The post-war period will undoubtedly show an expansion in fruit crops such as mangoes, citrus, plums, cherries and jackfruit as well as in industrial tree crops such as coconuts, oil palm, cocoa, tea, and pepper. Bananas and pineapples, although not tree crops, offer post-war opportunities. Courses in the production of all these crops should be taught either in the specialized training program (technical education) or in short courses for adult farmers. Horticulture should be emphasized in the vocational and technical curriculum.

Miscellaneous Crops. - In some areas of South Vietnam there are several crops that could be grown on small land holdings with high financial returns and could assume export importance. The crops are specialty crops and include the strawberry of

Dalat (Central Vietnam) which has a unique flavor, and the black pepper of Hatien (Delta), Phuoc Tuy (Eastern Region). A sound agricultural education program will, therefore, need to consider the above local potentials to help achieve agricultural economic development.

Livestock Production

South Vietnam is also in a position to produce more livestock and poultry products once the anticipated increased production in rice, feed grains and oilseeds meets the feed problem,

The climate and other circumstantial features have shown varied facilities for the livestock development. So far the Mekong Delta provides one of the world's best regions for duck raising. According to many Vietnamese and American experts, the Central Highlands with its large grasslands appear suitable for dairy cattle and beef cattle.

It is estimated by experts that ten years after the cessation of hostilities the hay production should increase 80 to 100 percent over current levels. Chicken production should increase 100 to 200 percent, ducks 200 to 220 percent, buffalo 25 percent, and cattle 70 to 80 percent (Vu Quoc Thuc et al., 1969, 2:199).

As local production of feed grain increases, more feed mills should be established. There should be, according to Vu Quoc Thuc et al., at least three mills with a daily production capacity of 50 to 100 tons each, and approximately 40 small mills set up in each of the provinces with a daily

capacity of 10 to 20 tons.

Thus, agricultural education courses in livestock production should vary somewhat with the region. Swine, poultry and duck production courses should be offered everywhere since these productions require less investment and bring quick return. However, emphasis on these production courses would be more in the agricultural schools in the delta, while cattle production would be emphasized in the highlands. Courses in animal feeding, ration formulating and feed mill operation must be intensified.

The increase of livestock production requires prevention of contagious diseases and parasites. The National Institute of Bacteriology and Animal Diseases in Saigon has produced large amounts of vaccines. Yet more vaccines are needed. Government programs of disease eradication are found helpful but insufficient. The country needs farmers with know-how in animal disease prevention as well as auxiliary veterinarians and laboratory technicians.

Courses in animal health care, animal disease, and veterinary science must be included and taught according to the level of the program and its objectives.

Fishery Development

South Vietnam lying along the continent coast of Southeast Asia has a coastal length of 2500 kilometers, and abounds with a wide variety of sea products. Its numerous internal ponds and rivers provide an additional resource in the form of inland fishing.

The fishermen are very skillful, but like many farmers in Vietnam, they have been very reluctant and skeptical about modernizing their traditional customs and practices. The training of fishermen, and the application of new techniques in fishing and pond fish culture, have contributed to the increase in production of fish from 52,000 metric tons in 1957 to 588,000 metric tons in 1971.

Investment opportunities requiring limited capital, such as the increase in areas of farm fish ponds, the establishment of fishponds in the brackish water of the coastal areas using milk fish, and that of fish hatcheries to produce fish for stocking purposes, will contribute greatly to the economy of South Vietnam. Farmers and fishermen will need training to improve their fishing, fish raising and fish marketing skills. Preparatory and supplementary courses should be included in both the regular day classes and part-time or short-term training classes.

For long range investments, such as establishment of canning factories and processing plants, technicians should be trained in post secondary education programs.

Rehabilitation of Plantations

Rubber. - The most important plantation crop in Vietnam is rubber. It accounts for a large portion of foreign exchange generated by exports. In 1965 there were approximately 3000 hectares in which the units were less than 500 hectares in size and owned by the Vietnamese, and 70,000 hectares in units of 1,000 hectares and over owned by foreigners-

primarily French and Belgian.

The security situation, the destruction of trees and the lack of labor has brought about a widespread abandonment of plantations. Vu Quoc Thuc et al., (1969, 2:214-220) have suggested a rehabilitation program including the following approaches:

Obtaining a return from the land while replanting through the sale of old, damaged (by disease or insect) trees as firewood or, according to the Rubber Research Institute, to make paper (Japan) or plywood (Malaysia). Additional returns could be had by interplanting the rubber clones for three years with annual leguminous crops;

increasing output per acre by planting and/or replanting with high yield rubber clones and by the application of fertilizers;

reducing cost of production by increasing efficiency of tapping by the use of the continuous flow system and by applying hormones;

improving rubber quality and marketing situation. Such a rehabilitation program suggests modification in the content of the training of workers for the plantations in the vocational and technical agricultural educational program.

Tea. - Tea is the second most important crop for South Vietnam export. Production of tea has been dropping over the years because of widespread abandonment of plantations amounting up to more than 3000 hectares.

In the post-war era, efforts should be made in five directions, according to Vu Quoc Thuc et al., (1969, 2:223 - 224):

replant some of the abandoned plantations;

expand the area under production;

improve the fertility status of the soils;

encourage resettlement in the highlands; and study feasibility of small industry.

A rehabilitation program of this type requires courses of instruction in tea production with emphasis on pruning tea stumps, replanting, and fertilizing.

Forestry. - In spite of many damages, Vu Quoc Thuc et al., (1969) saw three major developments in the wood based industries; timber supplies for the Mekong Delta; development of the saw milling industry; and production and export of cinnamon. The Directorate of Forestry, Republic of Vietnam, still reports encouraging crops of pine as well as timber and wood of the open forests as indicated in the previous study of the present agricultural situation of South Vietnam.

In the past, the majority of the forest management training programs have focused upon providing personnel for civil service positions within the government. Future programs must be expanded to provide training for people whose interests lie in the development of private forest industries. This will attract more students of broader abilities and interests who want to equip themselves for professional forest careers. The program will have to emphasize:

reforestation to rehabilitate the nation's forests;

the logging and transportation methods which reduce cost and increase efficiency; and

the protection of forest reserves and national parks.

Mechanization in South Vietnamese Agriculture. - Mechanization in agriculture has been at a very low level and has changed very little over the past century in South Vietnam. Planting, weeding, and threshing have been almost exclusively performed by hand labor. The major power for field work has been buffalo and cattle. Farms are very small and the average farmer is poor, both of which have been obstacles to mechanization.

However, smaller items such as water pumps, mechanical pesticide sprayers, small power tillers are gaining wide acceptance with the demand far exceeding the supply. In the delta there are more and more farmers who rent their labor and tractor for plowing and, here too, the demand for their work far exceeds the supply.

With more extensive and intensive agriculture occurring in the post-war period, mechanization on a larger scale will become mandatory. Tractors will be required in developing new farm lands, in levelling fields, for digging canals and ditches and in seed bed preparations. In most cases, harvesting will probably continue to be done by hand, but threshing will be done with pedal or power driven small portable threshers. The more intensive use of land and harvesting during rainy seasons will require drying facilities to reduce the moisture of rice, corn, or sorghum where it can be safely stored.

Thus, due to a great need for multi-purpose tractors, threshers, driers, pumps, spraying equipment, and power

tillers there will be a need for technicians and farmers capable of operating and maintaining that equipment. Agricultural mechanics, therefore, must be taught in the curricula of secondary agricultural education programs, both in regular and short or part-time classes. A curriculum in agricultural mechanics must be offered at the technical level to produce technicians needed by both the private and government sectors.

3. Summary of Potential of Agriculture in the South Vietnamese Economy.

In summary, the study of the potential of agriculture in the economy of South Vietnam indicates that:

South Vietnam is essentially an agricultural country;

the soil conditions and climate are propitious for a diversified agricultural production;

the war has seriously damaged the country, but the agricultural potential still exists;

the economy of the country will be improved if adequate techniques, equipment and facilities are used such as improved seeds, use of fertilizer, and mechanization;

the economic development of the country requires the right kind of production in which the internal and export needs are surveyed. The potential of the country such as soils, climate, manpower must be used and developed to their best;

differences in soils and climate in this long and narrow country indicate that different emphasis has to be put on different localities. At least two types of content must be offered in the agricultural courses as crops, livestock, production, and forestry vary in the highlands and in the lowlands (Delta, Eastern Region, Central Coastal Lowlands);

the increase of mechanization in farming, logging and transportation of timber, the need of skilled workers in feed mills, food processing and canning, the use of motor boats and sonar equipment in fishing suggest non-farming courses and a constant updating of technical courses must be implemented;

programs in agricultural production must: (1) give priority to rice and coarse grains as food and exported crops; (2) emphasize on oilseeds with high valued meal component; (3) stress rehabilitation of the plantations in courses in tea and rubber; (4) include courses in swine, poultry and duck raising in the delta while emphasizing cattle production courses in the highlands; (5) include fish pond culture and sea fishing in fishery courses; and (6) emphasize rehabilitation of the woods in forestry courses.

Needs for Manpower in Agricultural Development

Several studies of manpower problems have been undertaken in Vietnam and some are still in progress, but most of them are concerned with specific and short term issues. For example, much work has been done on the implications of current military and paramilitary activities and the potential impact of recruitment policies on the availability of labor for military contractors, private employers and agriculture.

Little attention has been paid to long term post-war manpower problems. Possibly as many as 900,000 people will have to be provided either with assistance to reestablish themselves in self-employed agriculture or with opportunities as wage and salary workers in peacetime construction programs such as housing, roads, service industries, private manufacturing industries and in plantations and forest industries. The above is a result of the reduction in employment opportunities due to the war.

This section is an interpretation of the census data of the South Vietnamese Departments of Labor and Education, and the studies of Vu Quoc Thuc et al., (1969) to establish the magnitude of agricultural manpower in the first ten years following the war. A comparison of such a magnitude and what the Vietnamese agricultural education program has

accomplished thus far will indicate whether an agricultural education program is needed.

1. Distribution of the Labor Force

In 1955, a United Nations Economic Survey Mission estimated the economically active population of South Vietnam as 42 percent of the total (the range of participation in Asian countries being set between 31.7 and 51.6 percent). The population then was 12,067,000. If this participation percent was correct, it indicated a labor force of 5,068,140. Vu Quoc Thuc et al. (1969, 1:128 - 130) indicated that 90 percent of the suggested distribution was in agriculture.

Surveys of employment in industrial and commercial establishments were made by the South Vietnamese Department of Labor in 1960 and 1966, and in 1960 a census was also taken of the agricultural population. The 1960 surveys resulted in estimates very different from the previous ones: a labor force of 5,207,000 and a participation rate of 37 percent. The figures indicated 85.3 percent of the labor force was engaged in agriculture. The 1966 survey gave a participation rate of 38.2 percent and there were 69.5 percent engaged in agriculture.

Data of the distribution of labor force in agriculture of these surveys indicated in Table 2 can be summarized as follows:

	<u>1960</u>	<u>1966</u>
Total Population	14,072,000	16,500,000
Total Labor Force	5,207,000	6,105,000
Agriculture (general)	3,982,000	3,965,000
Plantation	61,000	26,000
Fishing	191,000	254,000

Table 2
Distribution of Man Power in South Vietnam
(1960 - 66)

Activity	1960 (1)		1966 (2)	
	Thousand	%	Thousand	%
Agriculture	3982	76.4	3965	64.9
Plantation	61	1.2	26	0.4
Fishery	191	3.7	254	4.2
Mining	1	-	2	-
Trade and Industry	124	2.4	168	2.8
Construction	50	0.9	131	2.1
Electricity and Water	3	-	4	-
Commerce, Bank and Insurance	206	4.0	134	2.2
Transportation	145	2.8	149	2.4
Services	135	2.5	182	3.0
Civil Servant and Militarymen	309	6.0	1010	16.5
USAID and contracted Officers	-	-	80	1.3
Total	5207	100.0	6105	100.0

Source: (1) - Inventory of SVN Ministry of Labor

(2) - Afterwar Planning Committee - Report of Development Policies and Programs of the Republic of Vietnam, Saigon, 1969.

2. Scope of the Agricultural Employment Problem

The South Vietnamese population is estimated to have increased at an average annual rate of 2.6 percent over the last few years. Experienced observers in medical and social fields suggest that the average annual increase may be much higher. It is not therefore, impossible that at least for a time after the end of the war, the rate may rise to 3 percent and will stay high until family planning achieves wider acceptance and becomes effective.

The current rate of participation of the population in the labor force is thought to be about 37 percent. With the end of the war and the removal of the restriction on mobility imposed by it, an increase in this rate may well occur and be at least 45 percent since 45 percent of the present Vietnamese population is currently in the 15-25 year age group. Vu Quoc Thuc et al., (1969, 1:128) suggested a rate of 40 percent participation. At 40 percent, and assuming a population growth of 3 percent, the labor force would total about 9 million by 1984--an increase of 3 million, representing 300,000 new employment opportunities required each year. If the population growth rate remains at the presently assumed 2.6 percent and the rate of participation stays constant at 37 percent, then the labor force will approximate 7,925,000 persons by 1984; an average annual requirement for over 200,000 new jobs. This is the absolute minimum that will be required.

These are the parameters and it is probably reasonable to assume the annual growth rate of the labor force will fall between them, i.e. 250,000. Assuming 69.5 percent of this labor force increase engages in agricultural occupation, 173,750 seems to be a reasonable basis

for the formulation of agricultural manpower projections and policies for training.

One must note here, however, that the Vietnamese agricultural employment problem consists of two interrelated problems: the immediate post-war task of finding employment for refugees and labor surplus of the military and the necessity for meeting the long-term employment requirements of a labor force.

The most important first step toward solving the long-term problem is an effective family planning program, because the size of the labor force is a direct function of the size of the population. The educational system could have a significant long-term impact on the size and the composition of the labor force. For example, compulsory education through the secondary education level would eliminate an appreciable number of young people from the labor force. However such would require an investment in education that may not be practicable for many years to come. But at least some changes should be made in the educational system which would yield greater numbers of more readily employable school drop-outs and graduates. As indicated by Table 3 the present student enrollment showed that the ratio of students in the academic program to those attending a vocational technical program in 1971 - 72 is:

Trade and Industry:

$$\frac{\text{Vocational High School}}{\text{General Education}} = \frac{14,705}{840,953} = 1.7\%$$

$$\frac{\text{College Level}}{\text{University Enrollment}} = \frac{999}{68,649} = 1.4\%$$

Agriculture:

$$\frac{\text{Vocational High School}}{\text{General Education}} = \frac{8,586}{840,953} = 1.02\%$$

$$\frac{\text{College Level}}{\text{University Enrollment}} = \frac{590}{68,649} = .9\%$$

The above ratios indicate that both vocational and professional education in agriculture and in trade and industry of South Vietnam are given very little importance in the total education program. It is important, therefore, that the South Vietnam educational system be as responsive as possible to the needs of the economy. So far it is not. Agricultural education both at the secondary and college levels must be increased. Indeed, some experts in vocational education estimate agricultural education and other vocational education programs must comprise at least 25 percent of the total student enrollment in order to provide sufficient manpower for developing a country.

Something will also have to be done to prevent what is quite likely to happen in the post-war period--a shift from rural underemployment into urban employment. All feasible measures should be taken to discourage and reduce the movement of the people into the cities, for when unskilled people arrive they tend to form hard core pockets of unemployed and unemployables. Solutions range from increasing attractiveness of farm life to the modernization of agriculture which will facilitate acceptable levels of production to be achieved and enable more people to be economically independent on the farm. Agricultural education certainly plays a role in such solutions.

The most immediate problem which the agricultural education program has to consider is that of the war refugees. On July 31, 1968 official sources stated there were 1,122,958 registered refugees, both in camps and reception centers and outside them (Vu Quoc Thuc et al., 1969). Numbers of refugees fluctuate considerably depending upon

TABLE 3

Student Enrollment in South Vietnam: 1971-72*

	<u>Public</u>	<u>Private</u>	<u>Total</u>
Secondary Academic Education			
6th to 9th grades	316469	340447	840953
10th to 12th grades	74436	109601	
Colleges other than agriculture and trade and industry	63035	5614	68649
Trade and Industry			
College	999		999
High School (8th to 12th)	9918	4787	14705
Agriculture			
College	590		590
High School (8th to 12th)	8586		8586

* Compiled from Statistical Reports of the South Vietnamese Department of Education 1971 - 72.

the location and severity of the fighting at any one time. But in the northern part of South Vietnam a regular pattern is appearing: in a 12-month period, about 1 million people registered as refugees; roughly 700,000 of these returned to their village or were otherwise resettled, while about 300,000 continued in refugee status adding to the build up of previous years. Almost all the refugees are farm families. Many are awaiting an opportunity to go back to their native villages when the war ends. Numerically the refugees constitute the most serious aspect of the post-war employment problems of South Vietnam. Vu Quoc Thuc et al. (1969) assumed that 75 percent of the refugees would wish to return to their farms. Assuming the estimated total of 1,200,000 refugees remaining at the end of war as constant, with 37 - 40 percent of them economically active, some 480,000 job opportunities will be required; up to 360,000 of which will be farming on lands either abandoned during the war or to be opened in new land development projects. Short courses and intensive courses in agricultural production should be included in a comprehensive youth and adult agricultural education program.

3. The Demand for Agricultural Professionals

Agriculture is the main source of employment for both the immediate and long term demand of jobs after the war period. Agriculture and its related business and industry is no doubt the main sector of the Vietnamese economy. In addition to skilled farmers, the country needs professional and technically trained manpower in other aspects of agriculture.

Table 4 gives an estimate of professional and technical manpower

in the post war decade made by the University of Florida Team (1967). The estimate was to meet an expanding economy when peace comes, with more emphasis on governmental needs than the private sector and the MeKong project

Table 4
Estimate of Manpower Needs of South Vietnam
by the University of Florida

	1st Five Years		Next Five Years	
	College	Agri. Schools	College	Agri. Schools
Plant Science	260	1180	610	2610
Ag. Engineering	100	460	260	1600
Ag. Economics	67	50	155	1100
Vet. Medicine				
Doctor's	160		170	
Bachelor's	220		230	
Technicians		340		250
Fisheries	50	155	90	240
Forestry	105	285	240	675
Total	962	2470	1755	5475

Based on the present cultivated land and the additional land that can be cultivated after the war (4 million hectares), the actual livestock population and its possible increase, the need of management and rehabilitation of 5.6 million hectares of forests, and the seafood catch potential, the Directorate of Agricultural Education, Republic of Vietnam gave another estimate (1971). Table 5 gives the Vietnamese

estimate which looked at the total potential of agricultural development of the country.

Table 5

Estimate of Manpower Needs of South Vietnam
by the Directorate of Agricultural Education

	Engineers	DVM's	Technicians	Agents
Plant Science	3000		6000	12000
Ag. Engineering				
Ag. Economics				
Forestry	300		600	1200
Animal Husbandry	2000	500	4000	8000
Fishing	150		450	
Total	5450	500	11050	21200

4. Present Professional and Technical Trained Manpower

Under the French protectorate, up to 1945, 350 Engineers and Veterinarians and about one thousand Agents or Junior Technicians had been trained in the whole Indochina. When the Treaty of Geneva divided Vietnam into North and South Vietnam (1954) some trainees have died while many remained in North Vietnam. South Vietnam, therefore, had a shortage of manpower. In 1954 only 130 Engineers and Veterinarians and 400 Agents worked in the agricultural services of South Vietnam.

Implementing Articles 19, 20, and 21 of Decree 43 - BCN - ND dated December 4, 1952, the Directorate of Agricultural Education of South Vietnam was established under the title of "Directorate of

Technical and Practical Agricultural Education," and placed under the Department of Agriculture. It opened three schools, namely:

- a. The National College of Agriculture, Animal Husbandry and Forestry of Baoboc (technical level on December 12, 1955 and college level on November 30, 1959).
- b. The School of Agricultural Practices of Cantho on December 16, 1957, and
- c. the School of Agricultural Practices of Hue on February 2, 1959.

With these three schools, the Vietnamese Directorate of Agriculture tried to meet the demand for a staff of 470 Engineers or Veterinarians, and 2700 Agents for the government's ten-year development plan 1954 - 64. The result was only 143 Engineers, 388 technicians and 491 Agents graduated from these schools during the required period.

From 1965 to 1971, 437 Engineers, 519 Technicians and 460 Agents were trained. In addition to this trained manpower, 447 junior cycle and 30 senior cycle teachers graduated from the agricultural teacher training program totalling up to 580 Engineers, 907 Technicians, 951 Agents, 437 junior cycle teachers and 30 senior cycle teachers; a manpower far short of meeting either Vietnamese or American estimated need of professionally or technically trained manpower (Table 6).

TABLE 6
Trained Manpower in Agriculture*

Year	Engineer			Teacher Training				Technician				Agent			
	AG	F0	AH	AG	F0	AH	FI	AE	HE	AG	F0	AH	FI	AE	FI
1958										20	15	15			
1959										24	11	11			
1960										19	18	09			
1961										42	22	18			
1962	19	10	17							45	17	16			
1963	22	14	17							29	03	21			
1964	26	3	15							16	--	7			
1965	13	13	16							44	18	21			
1966															
1967	41	17	22	9	11	3				16	10	8			7
1968	53	16	28	30	8	8				46	9	17	9		21
1969	35	21	17	33	15	25	19	17		29		19	19		11
1970	48	21	18	34	27	19	14	20		29	17	27	22	17	14
1971	30	14	14	30	29	17	19	21		55	30	31	24	12	23
Total	287	129	164	136	23	121	66	50	41	414	170	220	74	29	39

AG = Agriculture; F0 = Forestry, AH = Animal Husbandry, FI = Fishery, AE = Agric. Engineering
HE = Home Economics

* Compiled from data of Dir. of Agric. Education and College of Agric., Saigon, Vietnam

5. Conclusion

In the next decade it is estimated that an average annual requirement of 173,750 persons will engage in agricultural occupations.

When peace comes, up to 360,000 war refugees will go into farming on lands either abandoned during the war or to be opened up in new land development projects.

The present investment of South Vietnam in agricultural education is less than 2 percent of the total education both at the secondary and the college levels.

The South Vietnamese agricultural education program at the secondary and college levels did not meet the needs of the ten year development plan 1954 - 64, and only exceeded them slightly in 1971. It will not meet either American or Vietnamese estimates of the needs for manpower unless the South Vietnamese agricultural education program is given more emphasis in the total education program. It is necessary that the educational program provide students the opportunity for an agricultural education in every rural school in the country.

Historical Perspective of Agricultural Education in South Vietnam

1. Agricultural Education in Vietnam during the French Protectorate

Agricultural Education in Vietnam was started in 1917 when the country was under the French Protectorate. The purposes were to train technical civil servants for the government of the following two types: low cadre technicians in agriculture or forestry called Agents; high cadre technicians in agriculture or forestry called Indochinese

Engineers, or in veterinary medicine called Veterinarians.

The training for agents was done at the School of Agricultural Practices at Bencat (South Vietnam) and Tuyen Quang (North Vietnam). The Engineers and Veterinarians were trained in the Superior School of Agriculture and Forestry and in the Superior School of Veterinary Medicine of Hanoi.

a. Schools of Agricultural Practices at Bencat and Tuyen Quang

On December 10, 1917 and March 17, 1918, two Arretes were signed by Albert Sarraut, Governor General of French Indochina. They established the first agricultural schools of French Indochina as well as Vietnam: one in Bencat, province of Binh Duong, South Vietnam; the other, in Tuyen Quang, North Vietnam.

Both had been agricultural experiment stations but changed into more or less farm schools offering short-term and demonstration type training to government agents before becoming officially organized as agricultural schools.

According to the two above mentioned Arretes and the one signed in April, 1941, the schools were financed by the local budget, chapter XXVII, article 3, paragraph 6. Yet both were placed under the authority of the Governor General who decided whatever he felt necessary about the administration and management of the budget. He appointed the director of the school whom he had subjected to inspection by the Director of the local agricultural services.

The teaching staff consisted of: the director of the school and the deputy director, each had to teach three hours

a week; the general manager who taught Vietnamese, French, mathematics and drawing; the agricultural instructors who taught agricultural manipulative skills.

The training was two years in duration. Students had to be from 16 to 18 years of age, physically able to handle farm work and have completed the sixth grade. They were recruited and proposed for approval to the governor general by the chiefs of the local agricultural services. Students were given free lodging and a monthly allowance. The training programs of 1917 and 1918 were not well defined. The 1917 and 1918 Arretes only mentioned that programs should emphasize manipulative skills and visits to model farms to give students experiences in the application of new techniques. The 1941 Arrete, however, did define the curriculum which included 1156 hours of theory and practice to be taught in two years. Students who passed the final exam received a certificate of "Primary Agricultural Education" and were hired by the government as agricultural Agents.

b. The Superior School of Agriculture and Forestry of Hanoi

On March 21, 1918, Albert Sarraut signed the Arrete establishing the first college level agricultural school both of Indochina and Vietnam. It was the Superior School of Agriculture and Forestry of Hanoi (Arrete of March 21, 1918).

This first college of agriculture and forestry had the following characteristics:

Organization. - The college was headed by a director chosen among engineers or veterinarians by the Director of Higher Education of Indochina and appointed by the Governor General of Indochina. A council of teachers assisted the director of the college in the administration and training programs.

The director of the college prepared the budget, fixed the time schedule, supervised the training at the school and approved the curricula of practical experiences at various agricultural experimental stations. He also inspected the agricultural schools of Tuyen Quang and Bencat which were used to provide practical experiences to his students.

The faculty consisted of teachers and lecturers holding degrees from various French Institutes of Agronomy and Schools of Agriculture or Silviculture of Nancy, Grignon, Rennes, Montpellier, and Versailles.

Students. - Students were recruited through a competitive examination and had to be French citizens, or French "protected", and hold the Baccalaureate II or at least the junior high school diploma.

Students received free lodging, free medical care, and free transportation to and from their homes during vacation periods and a monthly allowance.

Curriculum. - The curriculum consisted of general education the first year and technical education in the second and third year.

The second year training was done in part at the college and in part at an experimental station or school of agricultural practices in North Vietnam. The third year training was given at a school of agricultural practices in South Vietnam.

Both the Forestry and Agriculture sections received the same training in the first two years.

Graduates majoring in agriculture had to undergo an additional year of in-service training as an assistant to the director of an agricultural experiment station, while those majoring in forestry received additional training at the botany garden of the experiment station of Tuyen Quang.

Graduates were allowed to exploit the Indochinese forests and farming lands, or were hired by the government as Engineers in agriculture or forestry.

Subjects provided in the curriculum were:

First Year -- Physics, Chemistry, Botany, Zoology, Geology,
Mathematics, Mechanics, Accounting, General
Agriculture, Horticulture and Topography.

Second and Third Years -- Economic Botany, Agricultural
Zoology, Animal Husbandry, Soil Science, Rural
Economics, Sanitation, Meteorology, Food and
and Industrial Crops, Agricultural Engineering,
Silk Worm Raising, and Agricultural Accounting.

c. The Special School of Agriculture and Forestry of Indochina

The Superior School of Agriculture and Forestry of Hanoi was modified by seven Arretes signed on March 30, 1925, July 2, and October 5, 1928; June 22, 1931; September 13, 1933; July 3, 1934; and August 15, 1938. The last one signed by Jules Brevie gave the school the name of "The Special School of Agricultural and Forestry of Indochina" with the following final changes.

Organization. - The Special School was supervised by the Director of Public Education of Indochina for the non-technical part of the curriculum and by the Inspector General of Agriculture, Forestry and Animal Husbandry for the technical part.

The school was headed by a director who was required to be an engineer. The selection of the director was proposed by the Inspector General to the Governor General for approval. The director of the school was to manage the school and provide technical training as prescribed in the existing curriculum along with any improvement recommended by an advisory council consisting of the Inspector General of Agriculture, Forestry, and Animal Husbandry, the Assistant Director of Public Education, the Director of the Special School, the Inspector of the Forestry Service, and four representatives of the private enterprises in Indochina (3 from Vietnam, 1 from Cambodia).

Students. - Recruits had to have the Baccalaureate II degree. Cambodian and Laotian students not fulfilling this

requirement were admitted if requested by the Governor Superior of Laos or Cambodia. Students received monthly allowances. The number of recruits varied with the needs. Recruits never exceeded more than fifty according to the graduates of this school.

Training. - The training was a three-year program organized as follows:

First Year -- basic sciences taught by the University of Hanoi.

Second Year -- specialized training given at the Special School and divided into forestry and agriculture sections.

Third Year -- Field practice at the laboratories and experiment stations of the Rice Office, the Institute of Agronomy and Forest Research, and the training center of Agricultural Credits and Cooperatives.

Examination and Degrees. - Different from the previous reorganizations, the method of evaluation and the awarding of degrees were stated clearly in the last Arrete. Except for Drawing, Applied Topography and Wood and Iron Works where students were tested on their manipulative skills, students underwent a twenty-minute oral exam and a two-hour written test at the end of each course. At the end of each of the first two years, students took an overall exam. All tests, at the end of the course and on the overall, were graded on a scale from 0 to 20. The grade point average at the end of the first two years must be equal to

or above twelve to be admitted to the third year. The final grade was the average of the averages received at the end of each year. It must be equal to or above twelve to be considered successful and enable the student to pass. Graduates received the degree of "Indochinese Engineer" in agriculture or in forestry. Cambodian and Laotian students admitted through the request of their Governor Superior received the degree of "Cambodian or Laotian Engineer" in agriculture or forestry.

d. The Superior School of Agriculture of Indochina

On June 2, 1942, Decoux, the Governor General of Indochina, signed an arrete replacing the Special School by the Superior School of Agriculture of Indochina, having the following characteristics: (Arrete No. 166-D).

Organization. - The Superior School of Agriculture of Indochina had two sections--a French section for the French or French citizens and an Indochinese section for the local people.

The School was headed by a French director who had to hold either an Engineer degree in agriculture or a bachelor's degree in education. The director was appointed by the Governor General on a unanimous proposal of both the Director of Public Education of Indochina and the Inspector General of Agriculture, Forestry and Animal Husbandry. He was assisted by a dean of students and a twelve-member advisory council. The council, headed by the Inspector General,

supervised the training and recommended whatever improvements in curriculum and administration it felt needed.

Students. - Recruits had to have the Baccalaureate II degree with a major in mathematics. They had to pass a competitive entrance examination, a test of physical aptitude and a health check. The passing grade on the competitive entrance exam must be at least 10 over 20, i.e. a 2.0 grade point average. In 1944 the recruits were required to have an additional certificate in college physics, chemistry and mathematics, i.e. pass the freshman year of the college level in Vietnam.

Recruits received free transportation to and from home during vacation and a monthly allowance. They had to serve the government for at least ten years upon graduation.

Training. - The teaching staff consisted of teachers from the University of Indochina, engineers and experts from various agriculture, forestry or animal husbandry services, research institutes and Pasteur Institute. The teachers must hold either an Engineering degree in Agriculture or Forestry, a Doctor's degree in Veterinary Medicine, a medical doctor's degree or a Bachelor of Sciences degree.

The training program was three years in length. Its curriculum was organized somewhat similar to the Special School of Agriculture and Forestry of Indochina, namely: basic sciences were taught at the University of Indochina the first year; basic technical courses in agriculture,

animal husbandry and forestry were taught at the school the second year; and field experiences at government and private agricultural stations, farms, research institutes, zoos, and cooperatives were provided the third year.

Examination and Degrees. - The evaluation was unchanged as compared to that of the Special School. The degrees, however, were different. Students graduating from the French section received the degree of "Engineer in Tropical Agriculture (Indochina)." Those graduating from the Indochinese section received the degree of "Indochinese Engineer in Agriculture." Also the degree mentioned the major field of the graduates--agricultural engineering, Indochinese agriculture, research, credits and cooperatives, extension or agricultural economics.

e. Training of Forest Rangers

Looking into the historical facts, it seems that the French Protectorate officially trained manpower in forestry only twice: one in 1918 and again in 1943. The last time was to train forest rangers at Hanoi for the Vietnamese and at Phnom Penh (Cambodia) for the Cambodians and Laotians (Arrete, April 13, 1943).

The training, headed by a director and a dean of study, was of eighteen months duration. Teachers and lecturers had to hold either an Engineer's degree in Agriculture, a Bachelor of Science, or a Doctor's degree in Veterinary Medicine.

The curriculum consisted of:

First Semester--theories and practices of basic agriculture,
animal husbandry and forestry;

Second Semester--field experiences at the provincial services
of forestry;

Third Semester--theories and practices of specialized forestry.

Students underwent tests and final exams for every course.

Those measurements could be either a twenty-minute oral exam
or a two-hour written test. For the field experiences students
had to turn in monthly reports.

f. The School of Veterinary Medicine of Indochina

Different from the School of Agriculture which underwent
many reorganizations, the School of Veterinary Medicine remained
almost unchanged since its establishment in 1917 (Arrete,
September 15, 1917). Its title changed and its responsibility
was redefined when the School of Veterinary Medicine of Hanoi
was renamed the School of Veterinary Medicine of Indochina. The
change was made by the School itself.

The School of Veterinary Medicine had the following
characteristics:

Organization. - The School was headed by a veterinarian.

He was chosen and proposed by the Director of Higher Education
to the Governor General for approval. He was assisted by a
dean of students. Teachers were chosen among civil and
military veterinarians.

Students. - Students had to be French citizens, or French
protected, physically healthy and have finished high school.

They received monthly allowances and free transportation to and from their homes. They had to work at least ten years for the government upon graduation.

Training. - Differing from the curriculum of the School of Agriculture, the curriculum of the School of Veterinary Medicine was not given in detail (courses, time schedule).

It only mentioned:

First Year --Physics, Chemistry and Biology with emphasis on topics related to Veterinary Science, Anatomy and Physiology, Clinics, Anatomy of the Horse, Care of the Horse,

Second Year--General Anatomy and Physiology, Surgery, Pathology, Clinics, Meat Inspection, Drugs and Drug Use, Care of the Horse.

Third Year--Pathology, Infectious Diseases and Animal Sanitation Police, Clinics, Obstetrics, Animal Husbandry, and Animal Health Protection.

Examination and Degrees. - At the end of each year the students took a written and an oral exam for which the content was decided yearly by the director of the school. Students went to the next level only if they passed the exams. The final tests at the end of the third year consisted of: a written exam on Pathology, Infectious Diseases and Therapeutics, Obstetrics, Animal Husbandry, and Animal Health Protection, and a practice test on Pathology Surgery, Infectious Diseases, Meat Inspection, and Drug

Prescription. Graduates from the School of Veterinary Medicine received the Degree of Veterinarian.

2. Agricultural Education in South Vietnam (1954-62)

a. Directorate of Technical and Practical Agricultural Education

Under the French Protectorate, the Superior School of Agriculture of Indochina, the School of Veterinary Medicine of Indochina, and the Schools of Agricultural Practices of Bencat and Tuyen Quang had trained 350 Engineers and Veterinarians and 1000 Agents. From this trained manpower only 130 Engineers, or Veterinarians, and 400 Agents worked or came to work in the South Vietnamese agricultural services. To meet the need of trained civil servants, the Directorate of Agricultural Education of South Vietnam was established by Articles 19, 20 and 21 of Order 43 - BCN - ND, December 4, 1952, under the title of "Directorate of Technical and Practical Agricultural Education," and placed under the responsibility of the Department of Agriculture.

The objectives of agricultural education of the Department of Agriculture were to train Engineers, Technicians, and Agents for the government. The Directorate of Agricultural Education successfully established:

The National College of Agriculture, Animal Husbandry and Forestry of Baoloc (Order 43 - BCN - ND, 1952; Order 246 - BCN - ND, 1958) with the technician level beginning on December 12, 1955, and the engineer level on November 20, 1959.

The Schools of Agricultural Practices of Cantho on December 16, 1957 and of Hue on February 2, 1959 to train Agents (Order 331, BCN - ND, 1957).

b. National College of Agriculture, Animal Husbandry and Forestry

The National College of Agriculture, Animal Husbandry and Forestry was located at Baoloc (Blaao) about 100 miles north of Saigon on the National Saigon-Dalat Road at an altitude of about 300 feet.

In the period 1954 - 55 the South Vietnamese government and the American aid decided to use the abandoned Baoloc Agricultural Experiment Station as the site of the National College of Agriculture, Animal Husbandry and Forestry. Land was cleared, some wooden houses were built, and the technician level program started in 1955 with 95 enrollees.

The school was headed by a director assisted by three committees for the management of the school, supervision of training, and maintenance of discipline.

Recruited students had to pass a competitive entrance examination. They were to be Vietnamese, aged from 18 to 25, and having at least four years of secondary education (i.e. passed the ninth grade) for the technician level and Baccalaureate II for the engineer level.

The technician training consisted of two and a half years of course work and six months of field experiences. After one common year of basic technical courses and related science, students were grouped into three sections according to the government's needs--agronomy, forestry and animal husbandry. Graduates were called and hired as Technicians.

In 1959, the College was upgraded to college level with three additional years being added to the program. The three added years consisted of two and one half years of classroom work and one half year of practical training. Sixty students were enrolled in the first class at the college level. The American aid up to that time consisted of funds for developing the school and for scholarships to college trainees in the States. At that time two U.S. technicians, a librarian and an agricultural engineer were added to the staff of the school. The faculty was increased with foreign professors from the Council on Economics and Cultural Affairs Inc. and from the French Economic Aid Program.

c. Schools of Agricultural Practices of Cantho and Hue

The Cantho School is located on the outskirts of the city of Cantho about 120 miles southwest of Saigon in the delta region. The Hue School is located on the outskirts of Hue in the extreme northern portion of the Republic of Vietnam, about 50 miles from the 17th parallel.

Each school was headed by a director and was assisted by three committees as follows: an administrative committee to help the director in the management of the school; a teacher council to aid in the supervision of training; and a disciplinary committee to judge and decide disciplinary measures.

Students were recruited through competitive entrance examinations. They had to be Vietnamese, aged from 16 to 25 years old and have at least two years of secondary education (i.e., sixth

and seventh grades).

The training consisted of one and a half years of course work and six months of field practices. The first year, courses were basic agriculture and related sciences. In the second year, students majored in either agronomy, forestry, or animal husbandry. Graduates from both Hue and Cantho schools were called Agents.

3. Agricultural Education in South Vietnam (1962 - 74)

a. Directorate of Education in Agriculture, Animal Husbandry and Forestry

By the order No. 136-BCTNT - ND - HC, March 26, 1962, the Directorate of Technical and Practical Agricultural Education and the three agricultural schools of Baoloc, Cantho and Hue were transferred to the Department of Education. The Directorate was reorganized. It was simplified in the reorganization, but given increased responsibility. Its title was changed to the "Directorate of Education in Agriculture, Forestry, and Animal Husbandry." It was responsible for all levels of agricultural education--college level and technical and vocational education. Headed by a director and assisted by a division chief who was also the assistant director, the new organization included three offices--the bureau of personnel administration and accounting, the bureau of education research and planning, and the bureau of training and testing.

b. College of Agriculture of Saigon, University of Thu Duc

The College of Agriculture of Saigon was formerly the college

portion of Baoloc National College of Agriculture. In 1952, the security deteriorated at Baoloc. Two of the college teachers were detained for ransom by the Communists and on one occasion transportation between the school and Saigon was halted and the faculty was lectured by the Vietcong. Therefore, it was decided to move the college to Saigon.

By Order No. 168 - SL - VHGD, November 9, 1968, the college was restructured into the "National Agricultural Center" and was organized into three schools--School of Agriculture, School of Forestry and School of Veterinary Medicine and Animal Husbandry. The college was then placed directly under the Department of Education. The objectives of the Center were: (1) "to train high level agricultural technicians (engineers) for government and private agencies and enterprises; (2) to carry out basic and applied research and to renovate and update agricultural techniques practiced in South Vietnam; and (3) to disseminate new findings and improved techniques."

The training program was changed from a three year curriculum of about 2625 to 2705 hours of theory and laboratory work and 30 weeks of field experiences into a four year curriculum of 2915 to 3585 hours of theory and laboratory work and 16 weeks of field experiences. In both the old and new curricula students were required to write a report and submit it at the end of the training.

As in the old program students were recruited through a competitive entrance exam. They had to have the Baccalaureate II

and be in good physical health. They had to choose their major when applying for entry. The number of recruits was decided not only by the Department of Agriculture as before 1962, but by both the Departments of Education and Agriculture.

As before 1962, graduates held the degree of engineer in agriculture, forestry or animal husbandry. However, there was an additional indication of their area of specialization such as agronomy, agricultural economics, agricultural engineering, food crops processing, forestry, fishery or animal husbandry.

c. Agricultural High School

In 1963, the remaining part of Baoloc National School of Agriculture and the Schools of Agricultural Practices of Cantho and Hue were reorganized into agricultural high schools by the Orders No. 1185 and 1186 GD - PC - ND, August, 1963 of the Department of Education.

Twenty-eight other similar schools were established at Binh Duong and Tay Ninh in 1967; at Dinh Tuong, Ninh Thuan and Baxuyen in 1968; at Binh Tuy and Long An in 1969; at Phuoc Tuy, Phu Yen and An Giang in 1970; and at Quang Nam, An My, Vinh Binh, Sadec, Hatien, Khanh Hoa, Dalat, Binh Thuan, Caibe, Baclieu, Kien Phong, Long Khanh, Bien Hoa, Gia Dinh, Go Cong, Kien Hoa, Giao Duc, Cai Lay in 1971 - 74.

Organization. - Each school was headed by a principal assisted by a dean of study and a farm manager if the school comprised both junior and senior cycles (8th to 12th grades).

However, if the school was a junior agricultural high school (8th - 9th grades), the principal would be assisted only by a farm manager.

The above three positions comprised the School's Board of Directors. They were appointed by the Minister of Education on the proposal of the Director of Agricultural Education. The farm manager was in charge of the operation of the school farm, a demonstration place and land laboratory. The dean of study was responsible for the training.

One committee and two councils (the sponsor's council, the faculty council, and the disciplinary committee) helped the principal in the administration and improvement of the training of the school.

The sponsor's council included the province chief, a representative of the Student-Parent Association, a representative of the government agricultural agencies, two representatives of private agricultural business, and two representatives of the faculty and the school board of directors. The council's responsibility was similar to the advisory council in the United States. It looked for and provided scholarships to the students, equipment to the school and jobs to the graduates.

The faculty council met every three months or whenever called. It reviewed and approved the time schedule, school regulations, distribution of scholarships, and the semester

final grade reports of students. It studied and recommended the solution to any problems presented by the principal. Indeed, the principal sought the approval of the faculty council for any measure to be presented for passage by the Directorate of Agricultural Education. Consequently, the administration of the school was usually run on a democratic basis.

The third council was the disciplinary committee which played the role of a court judging student misdemeanors. The council consisted of the school board of directors, two teachers elected by the faculty and a representative of the Student-Parent Association. The president of the student body was allowed, in the recent years, to join the council as the defendant's attorney. The decision was determined by the majority of the votes of the council.

Students. - Vocational students were recruited from among Vietnamese students at two levels--the 8th and the 10th grades. Foreign students were admitted with special permission of the Minister of Education. To apply for vocational agriculture at the 8th grade, students had to finish the 7th grade of either the academic or pre-vocational agricultural curriculum. Those applying for vocational agriculture at the 10th grade must hold either an Academic or Vocational Junior Diploma. Technical students were recruited from among holders of agricultural Junior Diploma for the Agent training, and from among holders of agricultural Baccalau-

reate II for the Technician training. A competitive entrance examination was organized at any level of the above recruitment if there were more applicants than available places.

Curriculum. - The objectives of education at the agricultural high school were changed from training Agents and Technicians for private and governmental agencies and enterprises to:

training Agents and Technicians for private and governmental agencies and enterprises;

providing prevocational agricultural education to rural out-of-school youth and to 6th and 7th grade students and a vocational agricultural education program to the 8th through 12th grades;

providing short term training for adult farmers; and

preparing students for the colleges of agriculture.

Thus, the school offered:

a curriculum of basic agriculture for the 6th and 7th grades (prevocational agriculture) and for the 8th and 9th grades (junior cycle vocational agriculture);

a curriculum of specialized courses in agriculture (agronomy) animal husbandry, forestry, and agricultural engineering for the 10th through 12th grades (senior cycle vocational agriculture);

a curriculum of specialized technical courses to train Agents;

a curriculum of specialized technical courses to train Technicians; and

short term curricula for rural out-of-school youth and adult farmers.

The education was provided in the form of day classes for regular students and short-term and part-time classes

for rural out-of-school youth and adult farmers. All curricula except short-term and part-time classes were prepared at the national level by teams of subject matter specialists and professionals. The short-term and part-time curricula were prepared by the local schools according to local student needs and regional interest.

Both prevocational and vocational agriculture curricula had academic courses which were supposed to develop the student and to support the vocational courses--the other part of the curricula.

Examination and Degrees. - At the end of the 9th, 11th and 12th grades students took nationwide examinations for the agricultural Junior Diploma, Baccalaureate I and Baccalaureate II respectively. Students graduating from the technical training received the degree of Agent or Technician depending upon their training. Those graduating from short-term or part-time training received certificates.

Since 1970, the award of the agricultural Junior Diploma, Baccalaureate I and II, was on the basis of student achievement in class.

Only those who failed were to take the nationwide exam, i.e. they had a second chance. This privilege was not shared with students from private agricultural high schools.

d. Prevocational Agricultural Schools

The agricultural high schools had never offered any pre-

vocational agriculture as prescribed in the Arrete organizing them. Prevocational agriculture was provided by rural primary community schools.

Since 1963, attention has been focused on graduates of rural primary schools, i.e. those who finished the 5th grade. Most of them were unable to continue their education because public junior high schools (grades 6 through 9) could not meet the demand. Their competitive entrance examination recruited or selected students from a ratio of 1 for every 20 applicants. Meanwhile, vocational agriculture starting at the 8th grade recruited its students from the 7th academic grade.

Using the Arretes organizing the agricultural high school as a legislative basis, and convinced by some of their American trained staff, the Directorate of Agricultural Education and of Primary Education decided to provide prevocational agriculture whenever requested by the Student-Parent Association had to build classrooms and provide facilities for the educational program.

In 1966 the prevocational agriculture program was established at the pilot primary community schools of Bung (Binh Duong) and Chogao (Dinh Tuong). In 1970 twenty-six prevocational agricultural classes were established at the primary community schools of Quang Tri, Quang Tri; Hoa Phuoc, Thanh Chiem, Quang Nam; Da thien, Dalat; Phu Hoai, Tuyen Duc; Thuong Baoloc, Thien Lap, Lam Dong; Phu Long, Binh Thuan; Thanh Minh, Phu Vinh, Khanh Hoa; Tay Ninh, Tay Ninh; Tan Phu Trung 2, Hau Nghia; An My, Dong Ba,

Binh Duong; Thanh Hoa, Hatien, Kien Giang; Tan Hiep, Cai Be, Dinh Tuong; Benluc, Long An; Lap Vo, Tan Nhuan Dong, Sadec; Tinh Tam 3, Phu No, Ba Xuyen; Minh Tam, Binh Thuy, Phong Dinh; Hoa Binh, Bac Lieu. In 1971, twenty-nine more prevocational agricultural classes were approved and established: Dai Hao, Trieu Thuong, Quang Tri; Cam Ha, Quang Nam; Cam Thanh, Quang Ngai; Hung Dao, Darlac; Phuoc Khanh, Ninh Thuan; Hau Bon, Phu Bon; Thanh My, Tuyen Duc; Tan Bui, Lam Dong; Hung Loc, Long Khanh; An Hoa Hung; Bien Hoa; Tan Hiep, Gia Dinh; Chanh Hiep A Phu Hoa, Thanh Hoa B, Binh Duong; Nhon Nhung, Long An; Vinh Thanh, Tan Phuoc, Go Cong; Binh Hoa A, Thuan Hung, Tan Loc Dong A, An Giang;; Long My, Vinh Long; Nguyet Hoa, Vinh Binh; Tan Thach, Kien Hoa; Tra Quyt, Ba Xuyen; Vinh Trach, Bac Lieu; Cai Lay, Giao Duc, Dinh Tuong; Tan Tich A, Kien Phong.

Prevocational agriculture was successful among the rural Vietnamese people who perceived it as an opportunity for further education of their children. Every year, demands were received en masse. The Directorates of Agricultural Education and Primary Education had a difficult time screening out the locations to be granted for establishment of prevocational agriculture. The top authorities of the Department of Education were, however, not pleased with the system and the pressure from the Student-Parent Association. Their greatest fear was how to meet the demand for further education once the students graduated from the 7th prevocational agricultural grade, which, according to the law, corresponded to the 7th academic year.

Their general view, shared by people who believe in the philosophy "Education is reserved for the elite," was that the flexibility of such education was upsetting the educational administration. The future of prevocational agriculture may be endangered in spite of its sky-rocketing enrollment from 3260 to 9597 from 1969 to 1972 (Table 8).

e. Ethnic Minority Agricultural Centers

To help ethnic minorities living in the highlands of Vietnam to improve their standard of living, agricultural centers had been established by the International Voluntary Service, an international youth organization similar to the American Peace Corps. Although private, the International Voluntary Service was first funded by USAID, then by both USAID and the South Vietnamese government in their work with ethnic minorities.

Communication barriers, lack of local experiences, poor coordination between local agencies and the International Voluntary Service, and the failure of training led to a series of meetings between USAID and the Departments of Education, Agriculture, Ethnic Minorities, Rural Pacification, and Development of the Vietnamese government throughout 1968. The results were that the ethnic minority agricultural centers were transferred to the Department of Education.

By the Order No. 186 - GDTN - PC - ND, February 1, 1969 of the Department of Education, South Vietnam, twelve ethnic minority agricultural centers at Quang Tri, Quang Ngai (Region 1), Kontum, Pleiku, Phu Bon, Darlac, Tuyen Duc, Quang Duc, Lam Dong

Ninh Thuan, and Binh Thuan (Region II) and Phuoc Long (Region III) became agricultural schools where ethnic minorities were given first priority in admission and training.

The goals of the ethnic minority agricultural centers were similar to an agricultural high school, i.e. to provide vocational agriculture and short-term and part-time training. The organization was similar to a junior agricultural high school. Students were supposedly to be recruited from Montagnards. However, except those who attended short-term training, students were usually Vietnamese. The lack of security and the poor quality of teachers resulted in low quality agricultural education programs provided at the centers.

4. Achievements of the South Vietnamese Agricultural Education

Tables 6, 7, and 8 give a summary of data concerning the enrollment of graduates from vocational agriculture and from the technical training since 1955 to 1972.

As indicated by Table 8, the enrollment was low from 1955 to 1962 when it consisted of only Agent and Technician trainees. Enrollment has increased since 1962 when the vocational agriculture program was started. The prevocational agriculture program began in 1969 and expanded rapidly. The drop in enrollment of Agents and Technician trainees from 1962 to 1966 was due to the change of educational program--the trainees were to have agricultural Junior Diploma for the Agent training and the agricultural Baccalaureate II for the Technician training. The decrease in enrollment of Agents from 1969 to 1972 was due to less demand for Agents as seen by the Departments

TABLE 7

Graduates from the Vocational Agriculture

Year	Junior Diploma	Baccalaureate I			Baccalaureate II			Total
		AG.	F0.	AH.	AE	Total	AG.	
1963-64	135							
1964-65	102	52	20	20		92	42	80
1965-66	235	110	29	66		205	112	201
1966-67	282	109	80	77	18	284	94	230
1967-68	274	144	86	131	28	389	137	378
1968-69	471	152	83	149	42	426	133	395
1969-70	701	171	95	174	44	484	173	480
1970-71	967	408	4	342	49	803	377	733
1971-72	1495	681	102	633	220	1636		
Total	4662	1827	499	1592	401	4319	1068	2497

Major

AG = Agriculture

AH = Animal Husbandry

AE = Agricultural Engineering

F0 = Forestry

TABLE 8

Enrollment in Agricultural Education in South Vietnam

Year	Types of Enrollment				
	Grades 6-7	Grades 8-9	Grades 10-12	Agent	Technician
55-56					65
56-57					121
57-58				62	172
58-59				196	209
59-60				233	236
60-61				206	242
61-62				152	167
62-63		140	100	150	159
63-64		221	200	173	106
64-65		446	500	124	83
65-66		517	700	48	---
66-67		826	1090	71	46
67-68		993	1229	126	90
68-69		1481	1432	110	77
69-70	3260	2203	1851	97	136
70-71	7840	3811	3004	89	135
71-72	9597	5349	4134	80	136
	20697	15987	14240	1917	2180

of Education and Agriculture. Tables 7 and 8 indicate that not all students continued their education after Baccalaureate I, nor got into the teacher training or Technician training after Baccalaureate II. The sometimes higher number of holders of Baccalaureate I as compared to those of Junior Diploma was due to the fact that students recruited at the agricultural 10th grade may have the academic Junior Diploma. Many holders of Agricultural Junior Diplomas chose to stop their education or get into the Agent training.

The following indicates the total trainees, by category, of the South Vietnamese agricultural education during the years 1955 to 1972:

Vocational Agriculture	4,662 Junior Diploma Holders
	4,319 Baccalaureate I Holders
	2,497 Baccalaureate II Holders
Technical Training	951 Agents
	907 Technicians
Teacher Training	437 Junior Agricultural Teachers
	30 Senior Agricultural Teachers

The teacher training reported above, and in Table 6, is considered as an achievement of the secondary agricultural education program since the program was part of the activity of the Directorate of Agricultural Education instead of the College of Agriculture.

The Secondary Agricultural Education Program of
South Vietnam: Past and Present

For the purpose of this study, the agricultural education program of South Vietnam was evaluated on the level lower than a Bachelor's degree. It included the prevocational, vocational and technical levels. Emphasis of the appraisal was on the objectives, courses, time allotted,

and evaluation procedures of the program.

1. Objectives of the Program

Under the French Protectorate the objectives of the agricultural education program were expressed in the Arretes establishing the Schools of Agricultural Practices of Tuyen Quang and Bencat, the School of Agriculture of Indochina, and the School of Veterinary Medicine of Indochina as follows:

"to disseminate new agricultural practices to the farmers" (Arretes of March 17, 1918 and April 15, 1941);"

"to train assistants for the directors of private plantation, and agricultural agents for the governmental services" (Arretes of March 17, 1918 and April 15, 1941);"

"to train technicians in agriculture or in forestry to be able to use and exploit property--the Indochina land and woods" (Arrete of March 21, 1918);"

"to train high grade technicians for the governmental agriculture and forestry agencies of Indochina and qualified agricultural agents for the private section" (Arrete of August 15, 1938);"

"to train engineers in tropical agriculture for the French and Indochinese agricultural enterprises and industries" (Arrete of July 31, 1944);"

"to train veterinarians" (Arrete of September 15, 1917)."

In reality, when looking at the number of recruits, graduates, and their placement, one may say that the real goals were to meet a need of civil servants (veterinarians, engineers, forest rangers, agents) for the French rulers and to provide a college education in agriculture and in veterinary medicine to the French citizens. Graduating from the same curriculum of training, the Indochinese held a different degree and could only serve and work in Indochina.

The Treaty of Geneva (1954) brought an end to the 80 year old French protectorate. It also divided Vietnam at the 17th parallel with the Democratic Republic of Vietnam to the north and the Republic of Vietnam to the south. Only one-third of the trained agricultural agents, engineers, and veterinarians went to or remained in the south. The government of the Republic of Vietnam was in great need of technicians to develop the country's economy which was mainly agricultural.

On December 4, 1952 the Order No. 43 - BCN - ND was signed, defining the qualifications of governmental agricultural cadres of "technicians" and "agents" and establishing the directorate in charge of their training.

Article 14 of the Order No. 246 - BCN - ND, June 10, 1958 established the National College of Agriculture, Forestry and Animal Husbandry of Baoloc and stated that students having an overall average of 2.25, at the end of the training would receive a diploma and would be hired as technicians in agriculture (agronomy), forestry, or animal husbandry by the government.

Even when transferred to the Department of Education, the main objective of the South Vietnamese agricultural education program continued to be the same--to meet government's need of agriculturally trained staff. Both articles No. 26 of the Orders No. 1185 GD - PC - ND and 1186 - GD - DC - ND officially named the titles of the degrees awarded in the technical training at Baoloc, Cantho and Hue Agricultural High Schools as "Degree of Agent in..." or "Degree of Technician in..." depending on the specialization of the students. However, other

objectives were added to the agricultural education program of South Vietnam by the Department of Education. In the Orders establishing agricultural high schools other than Baoloc, Cantho and Hue, and those reorganizing the Ethnic Minority Agricultural Centers and in the five-year plan (1971-1975) of development of South Vietnamese agricultural education, were the following objectives:

- to provide an all day vocational agriculture instructional program;
- to provide technician and agent training;
- to provide short-term and part-time training to rural out-of-school youth and adult farmers;
- to provide a special vocational agriculture program to the ethnic minorities;
- to disseminate new and improved agricultural technology;
- to prepare students for college entry.

Investigating its present activities and products, it was found that the South Vietnamese secondary agricultural education program is working toward every objective it has established except the dissemination of new agricultural technology. The shortage of teachers with practical agricultural experience was the factor which inhibited the realization of objectives three and four.

2. The Technical Training Curricula

The technical training in the secondary agricultural education program of South Vietnam included two sections--the agent and the technician curricula. Within the agent training curriculum changes were made in the content, the allotted time, and the measurement or evaluation throughout its evolution from 1917 to 1972. Changes were

also made in the technician training curriculum.

a. Under the French Protectorate

The Agent Training Curriculum. - During the French protectorate the agents were trained at Tuyen Quang and Bencat. The first training curriculum from 1917 to 1941 was left totally at the discretion of the school. The Arrete of December 10, 1917 and that of March 17, 1918 only insisted that emphasis should be given to manipulative skills and visits to model farms. The Arrete of April 15, 1941, however, indicated that the curriculum offered 26 courses grouped into six parts covering 1150 hours and taught in two years.

Part 1 through Part 4 covering 200 hours each included: general agriculture, agricultural technology, rubber growing, specialized agriculture I and II, rice growing, silk worm raising, horticulture, fruit crops, rural engineering I and II, rural constructions, silviculture I and II, surveys, and meteorology. Part 5 (300 hours) included: physics, chemistry, geology, zoology, bookkeeping, sanitation, and rural economics. Part 6 (50 hours) had only one course: animal husbandry.

None of the courses except animal husbandry had their time schedule defined. The course content was left up to the teacher and the time schedule to the school director who may or may not ask the opinion of the faculty. The evaluation procedure of the students was not defined either.

The Technician Training Curriculum.- Only one type of technician was trained--the Forest Rangers (Arrete of April 13,

1943). The Forest Ranger training curriculum consisted of two semesters of course work and one semester of field experiences.

The first semester dealt with basic courses in agriculture, animal husbandry (notions of animal husbandry, notions of agriculture, etc.), basic sciences related to forestry (entomology, ecology, soils, topography, drawing), and basic courses in forestry (forestry, botany, wild game, notions of forestry, notions of forest law). The second semester was devoted to field experience while the third semester consisted of specialized courses in forestry economics, forestry geography, forest entomology, mycology and phytopathology, forest laws and jurisdiction, forest management, forestry topography, and construction of roads.

Better than the Agent training curriculum, the Technician training curriculum indicated the amount of time allotted to each course. It indicated the number of tests and whether or not a final exam was required. Like the Agent training curriculum, the course content was left to the Teacher's decision.

b. In the Republic of Vietnam or South Vietnam

The evolution of technical training curricula in South Vietnam can be divided into two parts: before 1962, i.e., under the leadership of the Department of Agriculture (1955 - 1962); and after 1962, i.e., under the leadership of the Department of Education.

Before 1962, due to pressure of needs in manpower for the government's staff, the training of Agents, Technicians and Engineers was planned on an intensive specialized basis. After 1962, the training was to meet the manpower needs of both the government and private sectors. None of the needs were urgent--the government poorly coordinated the administration between its departments and was unable to hire graduates although there was need. The private sector was more interested in the service industry and other types of industries requested by the Allied Forces: due to war than agricultural business. The lack of felt urgency of needs led to an upgrading of the technical training.

The Agent Training Curricula. - Under the leadership of the Department of Agriculture, the Agent training curriculum consisted of: two semesters of basic agricultural courses (introductory agriculture, introductory animal husbandry, introductory forestry, rural constructions, rural engineering, hydraulics, meteorology, agricultural economics, agricultural cooperatives and credits), a few basic sciences (math, physics and chemistry, zoology, botany), and humanities (English or French); and two semesters of specialized courses (Appendix 1 - Order No. 331 - BCN - ND). Only two majors were offered--agriculture and forestry. Compared to the Agent Training Curriculum established by the French, the curriculum had some similarities such as the existence of basic sciences and the course content left to the teacher's decision. However, some

improvements have been made. The time scheduled for each course was clearly divided into theory and practice. The two sections, forestry and agriculture, were taught separately in the second year. More time was scheduled for the whole curriculum (agriculture - 1980 hours; forestry - 1944 hours, both consisted of 1150 hours in the old curriculum). More courses were taught (two humanities, four basic sciences, twenty to twenty-six technical courses). The humanities--civics and foreign languages--were to prepare students as good citizens and to give them some knowledge in foreign languages so they could understand foreign technical information as there was little Vietnamese technical literature. Field experiences took seven (forestry section) to fourteen (agricultural section) percent of the whole curriculum while practices in the laboratory took thirty (agricultural section) to thirty-seven (forestry section) percent. At last, recruits had to have two years of high school, i.e., 6th and 7th grades.

Under the Department of Education, the Agent training curriculum was changed into a twelve-month curriculum with eight months of course work and four months of field experiences. The training seemed shorter than the curriculum before 1962. In reality, it was longer and higher in quality. The Order No. 410 - GD - NCKH - ND, March 7, 1966 required recruits to have the agricultural Junior Diploma. Holders

of this degree had to have either two years of pre-vocational agriculture or two years of academic high school education (6th and 7th grades) in addition to two years of vocational agriculture (8th and 9th grades). The new training curriculum was, in fact, an extension of the training of the junior vocational agriculture program. The junior vocational graduates, therefore, got out with an occupational specialization ready to work if hired.

Compared to the previous training curriculum for Vietnamese Agents the new curriculum aimed toward three objectives (not expressed in the curriculum guideline), namely:

to meet the needs of the government staff through a series of courses in administration, financial organization, legislation and government programs in agriculture, forestry, or animal husbandry;

to give the graduates a chance to work in a private enterprise of their own or that of someone else through specialized courses and field experiences; and

to give flexibility to the newly established secondary agricultural education program including pre-vocational and vocational agriculture in addition to the technical level (see Appendix 2).

In addition to the above differences, the new training curriculum offered four majors--agriculture (agronomy), animal husbandry, forestry and fishery. Each major had a curriculum consisting of 540 to 600 hours of theory, 400 to 450 hours of laboratory practices, and four months of field experience. All courses were specialized courses because students had received their basic training when

they were vocational students. The importance of each course was determined by a coefficient. Each course content was clearly defined by an official curriculum guideline. The evaluation of the student was, for the first time, defined clearly. It consisted of exams at the end of each course, reports of field experiences, a project plan, and a final overall exam. Exams upon the completion of each course consisted of a written and an oral exam or a test on laboratory work. Field experiences of the student were graded through a written report, an oral exam on the report and on his activity at the various locations where he was placed. The project plan and the final exam--a written and an oral exam--were graded by a committee appointed by the Department of Education.

To graduate, the student had to have an average grade equal to or above 12 over 20, i.e., about 2.25. The graduating grade was comprised of 25 percent of the average of the grades of the exams upon completion of each course, 25 percent of the field experience and project plan, and 50 percent of the average of the final overall exam.

The Technician Training Curriculum. - The policies governing construction of the Agent training curriculum also governed that of the Technician training curriculum. Therefore, the

Technician training curriculum set up by the Department of Agriculture differed from those established by the Department of Education.

The Department of Agriculture's curriculum was established by the Orders No. 246 - BCN - ND, June 10, 1958 and No. 3 - BCN - ND - HC, January 8, 1960. It consisted of a three-year curriculum as indicated in Appendix 3.

Trainees were recruited from students who had at least an academic junior diploma. Recruitment was on a competitive basis. The total number of recruits determined by the needs of the government never exceeded fifty for any major.

Three majors were offered: agriculture (agronomy), forestry, and animal husbandry. The objectives of the curriculum in all majors were to meet the needs for government staff. The training in every major included five semesters of theory and practice and one semester of field experiences. Like the Agent training curriculum, the Technician training curriculum had three groups of courses: humanities (civics and foreign languages), basic sciences (math, physics, chemistry, botany and zoology) and technical courses. The humanities (284 hours) and the basic

sciences (396 hours) were the same for all majors. Civics and foreign languages were aimed at the same goals as corresponding courses in the Agent training curriculum. Basic sciences were included to help better understand the technical courses. Technical courses, comprising 75 - 76 percent of the whole curriculum, were in two groups: basic courses which were the same for all curricula and taught in the first year; and specialized courses taught in the last two years. Among the basic technical courses were home economics, compulsory to all girls, and agricultural extension. The design of the curriculum focused on subject matter and discipline. The importance of each course was indicated by the amount of scheduled time in theory and practice, and by its coefficient. The total course work went from 1548 hours (agriculture and forestry majors) to 1602 hours (animal husbandry major) of theory; and from 1504 (animal husbandry major) to 1080 hours (the other majors) of practices.

Under the Department of Education, the Technician training curriculum was developed by occupational professionals or experienced teachers whenever there was a need. The design still focused on subject matter. The training lasted twelve months and was very specialized. Recruits were holders of agricultural Baccalaureate II, i.e., they had

at least three years of vocational agriculture (10th, 11th, and 12th grades). Thus, like the new training curriculum for the Vietnamese Agent, the new Technician training curriculum was a continuation of training of the senior cycle of agricultural education. Vocational graduates of this cycle, who for one reason or another could not go into college, were prepared through training to work for the government or the private sector.

The new Technician training curriculum was established, as stated previously, according to the needs of technically trained manpower in the country. It offers the following majors: swine production, rice production, and secondary food crops (1966); agricultural economics with emphasis on credit and cooperative (1970); fruit crops (1971); poultry production, farm mechanics, and wood technology (1972) (Appendix 4). The new curriculum being very specialized, offered six months of course work broken into theory and practice (720 hours) and six months of field experiences. Course work varied with the specialization provided by the major. It was usually heavy in theory (40 to 75 percent of the curriculum) and low in practice (25 to 60 percent) depending on the major. All majors offered two groups of courses. The first five courses (250 hours or 27 percent

of the curriculum) prepared students for government needs (administration in Vietnam, financial organization in Vietnam, methods and organization of work, extension methods, and statistical methods). The second group consisted of technical specialized courses. As in the old curriculum, the importance of each course was determined by its coefficient and the amount of time scheduled. It is interesting to note that all majors had the same allocation of time (720 hours of course work) and the same coefficient (40). This standardization was an attempt to go to college credit system as the Vietnamese agricultural educators planned the Technician training to later become a part of the college program. It should also be noted that both old and new Technician training curricula had the same system of organization of field practices and evaluation of student achievement as described in the new Agent training curriculum.

In summary, the technical training curricula had the following characteristics:

they were of two kinds: agent and technician training curricula;

they were to meet both the needs for government manpower and the private sector. In addition to this objective, the new curricula provided flexibility in the agricultural education program. Vocational students could get into a specialized training program after the 9th and 12th grades;

the old curricula was in reality shorter than the new curricula which required students to go through a vocational agriculture program before being admitted;

the old curricula offered humanities, basic sciences, introductory and specialized agricultural courses. The other courses were to be provided by the vocational agriculture program;

field experiences, a cooperative education endeavor, was used to compensate for the shortage of up-to-date experienced teachers and the lack of adequate equipment at the school. It did not, however, help in placement because of the lack of interest of the private enterprises in hiring new unexperienced graduates;

evaluation consisted of exams upon completion of the courses, a final overall exam, field reports and project plan.

3. Prevocational Agriculture Curriculum

When the agricultural education responsibility was delegated to the Department of Education, the Directorate of Agricultural Education faced a problem: the market of its Technicians and Agents. Although needed, these graduates were not readily hired.

The solution to the problem chosen by the Directorate was to lengthen the training of its graduates without decreasing the quality. As under the leadership of the Department of Agriculture, the Technicians were recruited from holders of the academic Junior Diploma. But in this case, they were to be holders of agricultural Baccalaureate I and II and were admitted into the training usually through a competitive entrance examination. The Agents trained under the Department of Agriculture were recruited from those finishing the academic 7th

grade. The Department of Education chose its students from those who passed the agricultural Junior Diploma.

Thus, South Vietnam had established a secondary level agricultural education program as a result of difficulty in placement of its technical training graduates. The secondary agricultural education program is parallel to the corresponding academic education program. The curriculum included grades six through twelve, and had three similar exams at the 9th, 11th and 12th grades--Junior Diploma, Baccalaureate I and II.

The change led to the loss of the American Aid whose representative in agricultural education preferred the old technical agricultural educational program. However, USAID soon changed its decision when the U.S. Secretary of Agriculture visited Vietnam and talked with some American trained civil servants. Since then, the American education system has influenced the shaping of the agricultural education program of South Vietnam, and has led to the evolution within the secondary agricultural education program to include the prevocational, vocational and technical levels.

The prevocational agricultural education program of South Vietnam was started in 1966. Its curriculum was similar to that of the 6th and 7th grades of the junior cycle secondary agricultural education curriculum established in 1963.

At first it had no objective other than what it was used for;

namely to provide graduates of the rural primary schools, unable to continue their education, agricultural information and knowledge to effectively help their parents in farming. A second objective was added when the Directorate of Agricultural Education determined that the system was not fitted to a sound philosophy of education. The top prevocational students were admitted to vocational agriculture (8th grade) without an entrance exam. The others could take the entrance exam with the academic students. This opportunity to advanced education was welcomed by the students' parents but disliked by some high authorities in the Department of Education.

The curriculum offered a two-year sequence of courses divided into three groups: humanities, basic sciences, and technical courses. The humanities (Vietnamese, history and geography, civics, French or English) and the basic sciences (math, physics, chemistry, and biology) were the same courses as provided in the parallel academic high school education (6th and 7th grades) program. The content and allotment of time of these courses between the two programs were very similar. The technical courses were titled agronomy, animal science, forestry, agricultural engineering and supervised farming and were designed to provide agricultural technology information and to introduce students to manipulative skills. The evaluation was in the form of quizzes and semester exams emphasizing replicative use of knowledge. Students had to possess a sound knowledge of the subject matter in order to

pass. The final grade of the student consisted of 40 percent of the first year average and 60 percent of the second year. The final grade must be equal to or above 10 over 20, i.e., a 2.0 average to pass.

4. Vocational Agriculture Curriculum

The vocational agriculture education curriculum in South Vietnam was divided into two parts (Appendix 5): the junior cycle (8th and 9th grades) which was the same for all students throughout the country, and which culminated in a nationwide exam to award the agricultural Junior Diploma; and the senior cycle (10th, 11th and 12th grades) which had two selective exams at the end of the 11th and 12th grades to award the degrees of agricultural Baccalaureate I and II. The senior cycle program was the same throughout the country and varied with the specialization of the students in either agriculture (agronomy), animal husbandry, forestry or agricultural engineering.

The vocational agriculture curriculum provided some flexibility. Students recruited to the 8th grade came from the prevocational agriculture program or from the 7th academic grade. Students applying for the 10th grade held either an academic or agricultural Junior Diploma.

The curriculum parallel to the academic high school program, followed the same type of selection, i.e., students were screened at the 9th, 11th and 12th grades for the degrees previously mentioned. The curriculum has three groups of courses: humanities, basic sciences,

and technical courses. The Humanities were taught 12 hours each week at the 8th grade level and 11 hours each at the other grades and included Vietnamese, history, geography, civics, foreign language, and philosophy (which was offered only at the 12th grade). Humanities offered in the junior cycle contained the same content and allotment of time as the corresponding courses in the academic high school program. Those offered in the senior cycle had the content and time allotment reduced--1 to 2 hours a week--as compared to corresponding courses in the academic high school program. Sciences--math, physics and chemistry and biology--had the same allotment of time--8 hours a week in the junior cycle and 11 hours a week in the senior cycle--and the same content as the corresponding courses in the academic high school program. Teachers were to relate the content, especially in biology, to the technical courses. In fact, teachers of biology were chosen from graduates of the college of agriculture. The inclusion of humanities and sciences with similar content and time allotment as the corresponding courses had in the academic high school program was to insure that the degrees in vocational agriculture had an equal value as the corresponding degrees in academic education. Later, emphasis and readjustment of subject matter related to agriculture was stressed in history, geography, foreign language and biology by many memoranda from the Directorate of Agricultural Education and in national faculty seminars. The emphasis was to achieve the objectives of agricultural education: full human and vocational development of the students.

The technical courses--14 hours a week at the 8th grade, 15 hours at the other grades--were the same for all junior cycle vocational students. They varied with the specialization of the senior cycle vocational students. Titled as broad field courses--agronomy, animal science, forestry science, agricultural engineering and supervised farming--they offered basic agriculture in the junior cycle and specialized agriculture in the senior cycle. Except for supervised farming, all technical courses were broken in small courses (Appendix 6). The content and the allotment of time of each sub-course was described in the form of topics in the curriculum guide. This content determined on a judgmental basis, focused on subject matter and was heavy with theory. The weakness was, however, corrected by the amount of time allotted to supervised farming (Table 9). Supervised farming, at first a course to provide work experience to the students, was later improved by the inclusion of project planning, record keeping, and project implementation.

The lack of professional experience, the frequency of the lecture method in the technical training of the teachers, the focus on subject matter in the curriculum design, the tendency of too large a covering of each broad field course and its sub-courses, all affected the teaching-learning activities which were not stated in the curriculum guideline. Replicative use of knowledge and lecture method were extensively used.

Table 9 - continued

B. Forestry Major

Courses	10th Grade		11th Grade		12th Grade		Total	
	T.	P.	T.	P.	T.	P.	T.	P.
Agronomy	40	20	20	10	0	0	60	30
Forestry Sci.	90	60	120	60	180	90	390	210
Animal Sci.	20	10	20	10	0	0	40	20
Agric. Eng.	20	10	20	10	0	0	40	20
Sup. Farming	0	180	0	180	0	180	0	540
Cumulative Total							530	820

C. Animal Husbandry Major

Courses	10th Grade		11th Grade		12th Grade		Total	
	T.	P.	T.	P.	T.	P.	T.	P.
Agronomy	40	20	20	10	0	0	60	30
Forestry Sci.	20	10	20	10	0	0	40	20
Animal Sci.	100	50	128	52	192	78	420	180
Agric. Eng.	20	10	20	10	0	0	40	20
Sup. Farming	0	180	20	10	0	180	0	540
Cumulative Total							560	790

D. Agricultural Engineering Major

Courses	10th Grade		11th Grade		12th Grade		Total	
	T.	P.	T.	P.	T.	P.	T.	P.
Agronomy	40	20	20	10	0	0	60	30
Forestry Sci.	20	10	20	10	0	0	40	20
Animal Sci.	20	10	20	10	0	0	40	20
Agric. Eng.	95	55	120	60	185	85	400	200
Sup. Farming	0	180	0	180	0	180	0	540
Cumulative Total							540	810

*T = Hours of Theory

*P = Hours of Practice

The Future Farmers of Vietnam, an organization similar to the Future Farmers of America, was introduced as an extra- instead of intra-curricular activity. The lack of understanding of the organization by teachers resulted in poor progress.

The evaluation was at first similar to that of the parallel academic education program . It consisted of two sections independent from each other: the evaluation at school, and that at the nationwide exams to award the degrees of Junior Diplomas, Baccalaureate I and II. The evaluation at school was used to rank the student and allow them to get into the next grade. Students at the 9th, 11th and 12th grades, however, had to pass the nationwide exam; i.e., they had to have the required degree mentioned above. Such an evaluation was one of the causes of poor education in South Vietnam. Students did not study hard throughout the year, especially when teachers had a tendency to test student ability once at the end of the semester so they would have a grade to report. The Directorate of Agricultural Education decided to use student achievement at school as the basis to award the degree in addition to passing on to the next grade. Only those students who failed would take the nationwide exam. The new evaluation system was introduced gradually from 1967 to 1970. It was liked by students and their parents but not always by teachers, especially older teachers. The reasons were: more work for the teacher as the semester exam was organized like the nationwide exam--except teachers stayed at their

schools for the grading; teachers were to report at least a quiz grade for each fifteen hours of teaching; and the lack of teacher integrity and impartiality.

5. Short-Term Training Curriculum

Short-term training curricula were used mostly at the Ethnic Minority Agricultural Centers. When the Directorate of Agricultural Education was under the Department of Agriculture, they were used twice, namely: to train community extension workers in 4-T clubs (a copy of the 4-H clubs in America) and to train government rural development and pacification para-military cadres.

The curriculum used by the Department of Education was to train adult and young highlander farmers. The curriculum was set up by the advisory council at the concerned schools and approved by the Directorate of Agricultural Education.

The objectives of the curriculum was usually to provide farming information and to upgrade farming knowledge of the ethnic minorities. The training lasted from one to two weeks in duration.

The courses offered emphasized manipulative skills such as rice growing, corn growing, plowing, irrigating, swine raising, and poultry raising. The content, however, usually focused on subject matter. The technical education of teachers and the way that technical literature was written were the main causes of teacher tendency toward replicative use of knowledge and emphasis on theory. The evaluation,

usually in the form of written tests more than tests on psycho-motor skills, was another factor leading to the emphasis of subject matter.

The Model of the Present Secondary Agricultural Education Program of South Vietnam

The present secondary agricultural education program is parallel to the secondary academic education program. It offers short term training, prevocational agriculture, vocational agriculture, and technical agriculture (Agent and Technician training) as indicated by the model presented in Charts 1 and 2.

1. Short Term Training

As Chart 1 indicates, the short term training is not an integral part of the total agricultural education program as it is claimed. The curricula offered by this short term training has the form of an agricultural extension program. The main objective is to disseminate information and to up-grade agricultural knowledge to ethnic minority farmers. The establishment of the curriculum, by an advisory council, which focuses on the needs of the students, is sound. The teaching and evaluation, however, is poor due to the lack of professional and practical technical experiences of the teachers.

2. Prevocational and Vocational Agriculture

The prevocational and vocational agriculture programs serve the urban high school students primarily. Selective entrance exams open

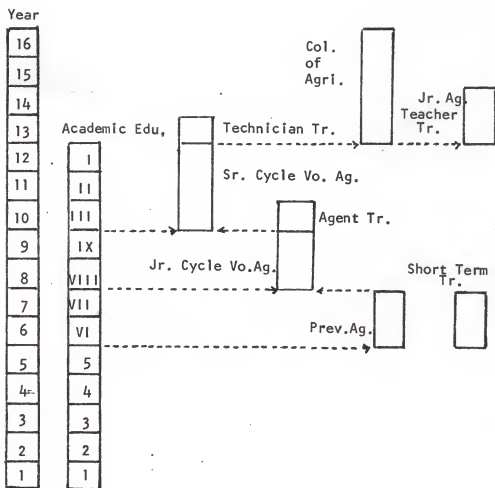


Chart No. 1 - Model of the Present Secondary Agricultural Education Program of South Vietnam

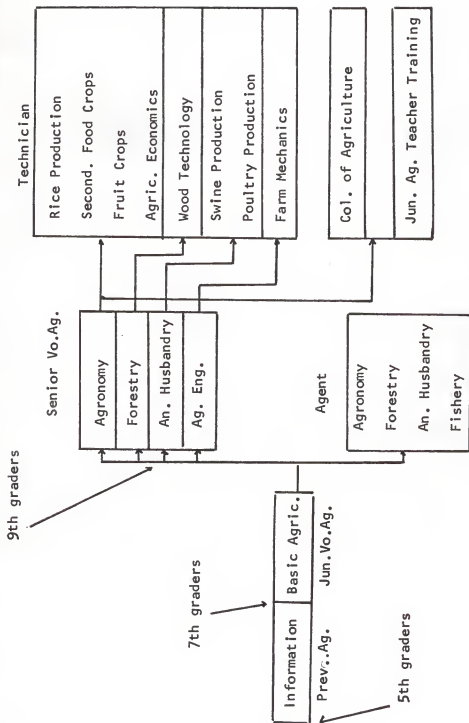
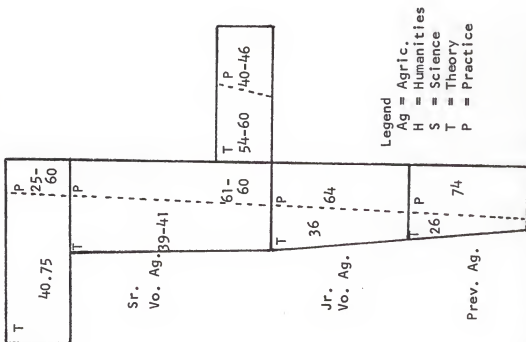


Chart 2 - Flow Chart of the Present Secondary Agric. Education of South Vietnam

Percent of Theory and Practice
In Agric. Courses



Percent of Courses in
Curriculum

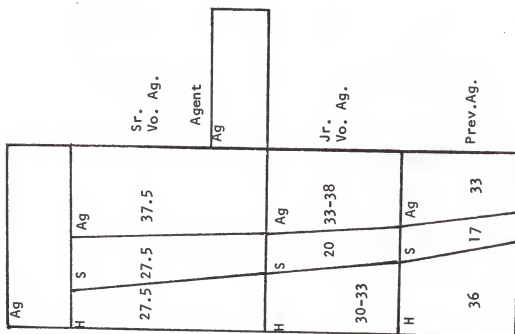


Chart 3 - Curriculum Content of the Secondary Agricultural
Education of South Vietnam

the education programs to the best academic students who are usually from towns and families who do not engage in farming.

The student's objective is to go through the technical training program in order to become Agents or Technicians, to go on to the College of Agriculture, or to go as far as possible and then be hired by the government. Few have the objective to become farmers or to be hired by the private sector.

There is little flexibility in these programs. There is only one curriculum at the prevocational level and at the junior cycle vocational agriculture program. There are four curricula within the senior cycle vocational agriculture programs. All schools implement the same curriculum depending on the level and specialization.

The curriculum content (Humanities: 27 to 36 percent; Sciences: 17 to 27 percent; Prevocational and Vocational Agriculture: 33 to 38 percent) focuses on subject matter (Chart 3). The curriculum designers were from the technical field. Their college training was either in France or Vietnam and emphasized subject matter. The curriculum content was selected at the discretion of the teacher and stressed the acquisition of subject matter or theoretical knowledge. The curriculum content, therefore, covered so many courses and topics (Appendix 6) that students have to go to school six days a week for 36 to 40 hours (Appendix 5).

The lack of professional education, the emphasis on the lecture method, and the subject matter in the technical education program of

the agricultural teachers lead to the emphasis on the use of replicative knowledge in the instruction. The teachers tended to substitute theory for practice in spite of a higher percentage of practice being prescribed (Chart 3).

Supervised farming projects were usually poor in quantity and quality. South Vietnamese agricultural teachers being weak in practical experiences approached this course with caution. Present financial regulations of South Vietnam are too strict to reimburse the teachers for transportation costs. The result is that teachers rarely visit the student at home or survey student projects done at home. Most schools prefer projects to be done on the school farm. The size of enrollment at any Vietnamese agricultural high school and the size of the school farm reduce the scope and number of student projects.

In spite of recent improvements, the awarding of degrees based on student achievement at school results in a selective process that eliminates students at the 9th and 11th grade levels. The selection at the entrance examination and the outlets to technical training result in few dropouts.

The path of training (Chart 2) led the students from agricultural information (prevocational agriculture) to basic agriculture (junior cycle vocational agriculture) and finally through specialized agriculture (senior cycle vocational agriculture). With an inclusion of humanities and sciences, the prevocational and vocational agri-

culture curricula seems sound in the vocational and human development of the child. The main weakness seems to be in the teachers.

3. Technical Agriculture

The technical agriculture is to provide a more specialized training program for the vocational students who hold Junior Diplomas or Baccalaureate II. Degrees. It provides outlets to vocational students who, for one reason or another, cannot continue their education to the college level. It is also supposed to meet the needs for qualified manpower of the government and the private sector. The military draft has resulted in very few graduates being unemployed. Most male graduates are drafted by the military service. The few remaining males and the female graduates are readily hired. Such a condition will not exist during peace time.

Students undergoing technical training have had from two to five years of vocational agriculture. The junior cycle vocational agriculture provides basic agriculture while the Agent training curriculum provides specialized agriculture in agronomy, forestry, animal husbandry and agricultural engineering. The technician training curriculum intensifies the specialization of students in rice production, secondary food crops, fruit crops, agricultural economics (for the vocational graduates majoring in agronomy), swine production, poultry production (for the vocational graduates majoring in animal science), wood technology (for the vocational graduates in forestry). Farm

mechanics (for the vocational graduates in agricultural engineering) (Chart 2). Thus, technical training graduates usually have extensive agricultural knowledge. Such knowledge is, however, heavy in theory as the technical curriculum was established on a judgmental basis with a focus on subject matter. The cooperative education program--one third to one half of the technical training curriculum--relies more on governmental agencies than private enterprises. Thus graduates have little or no experiences in agribusiness and such is a handicap which affects their demand in the private sector.

4. Advantages to be Preserved

The current model of secondary agricultural education programs in South Vietnam has certain characteristics which makes it appropriate to the educational system of Vietnam. These characteristics are seen as advantages and should be preserved. They are as follows:

- a. The Vietnamese society is familiar with the academic educational program in the evaluation of student achievement.

An agricultural education program totally separated from it as the ones established by the French Protectorate or by the Department of Agriculture of South Vietnam would cause its graduates to be looked down upon. Thus the agricultural education program must provide its graduates with the Junior Diploma, Baccalaureate I and II, i.e., the program must be parallel to the academic high school program and be a part of the total secondary educational program.

b. The academic courses in the present program are the same courses as taught in the parallel academic program. Their inclusion is to protect the students and also to help fully develop the students as human beings, future citizens, and facilitate the students in their technical training.

Both characteristics a and b should be preserved because, as indicated in Chapter 2 of this study, the secondary agricultural education program must be part of the total high school program. Such a program must develop agricultural students humanly and vocationally.

c. The connections between the agricultural education program and the academic one at the 5th, 7th, and 9th grades, and between the agricultural education program and the college level (Chart 1) should be preserved. The connections help to fulfill a philosophy of education where education prepares the individual to his fullest development and for entry into and advancement into an occupation. This philosophy is called the United Nations philosophy, or recently the career education philosophy in the United States. It will help alleviate the current heavy emphasis that "education is to train government staff (the old Vietnamese philosophy of education) or to produce the elite (the European or the French philosophy of education)."

5. Improvements to be Made

Taking into consideration findings in the review of literature, the analysis of South Vietnam's agricultural economic potential, the manpower needed to develop that agricultural potential, and the agricultural education program of South Vietnam, the current program of secondary agricultural education needs the following main improvements:

- The needs, problems and aspirations of the students and the community should be surveyed (Beam, 1961; Adams, 1970; Brenner, 1970). These surveys would help fulfill the community concept and focus on individual needs and interest in program or curriculum planning.
- The surveyed results should be used to determine the objectives of each curriculum at the community level in addition to those of the whole program determined by the survey of the agricultural economic potential and the manpower needs of the country.

All objectives should be stated in operational terms (Council of Great City Schools, 1970). Student goals and national educational goals should coincide with each other (Teshna, 1968). National objectives must aid in the development of the country (Malassis, 1966; Freeman, 1965; Sacay, 1931; De la Cruz, 1964).

The program and curriculum design must be a combination of designs (Alexander, 1974; Taba, 1962). Individual interest, social problems, subject matter and specific competencies are to be combined in the program or curriculum.

Social forces, human development, nature of learning, and nature of knowledge should also be taken into consideration in the development of the program and curriculum (Hass, 1974). The program must develop the students vocationally through "visual stimuli, cognitive information, affective awareness, and psychomotor skills" (Thompson, 1973).

The social forces of South Vietnam at the present time affecting the agricultural education program and curriculum planning are: (1) the mainly agricultural economy of the country and its still existing potential (Vu:Quoc Thuc et al. 1969; USDA, 1973-a; USDA, 1973-b); (2) the pressure for training about 360,000 war refugees who would establish in farming (Vu Quoc Thuc et al. 1969); (3) the pressure of an annual average of approximately 173,750 persons to be engaged in agriculture in the next decade; (4) the pressure of a needed 2,717 college trainees and 7,945 agricultural high school graduates for the government and the private sector in the decade following peace (University of Florida, 1967).

Human development, nature of learning and knowledge, as indicated by the review of literature, suggest that: (1) prevocational agriculture should deal with the awareness and understanding of agricultural occupations (Al Salman, 1965); it must use a combination of three designs focusing on individual needs, social activities in the community, and subject matter; (2) vocational agriculture programs should use the combination of designs of

prevocational agriculture, and switch the subject matter focus to specific competencies in the last years; and (3) technical agriculture should use a combination of individual interests, specific competencies and social activities in the community.

Courses should be kept broad (Long, 1968; Manley, 1969, Horner, 1970; Sherman, 1971). They should be subdivided further than the present titles of Agronomy, Forestry, Animal Husbandry, Agricultural Engineering, and Supervised Farming. An approach similar to the specialized courses indicated by the standard terminology of the National Center for Education Statistics, 1971, should be used in the grouping and naming of the courses.

The program must go along with rural development (Malassis, 1966). The climate and soil, two main factors of the agricultural economy and its development in South Vietnam, vary in four regions: The Mekong Delta, the Eastern Region, the Central Coastal Lowlands, and the Central Highlands. For example, livestock production is different in the highlands when compared to the lowlands. The content of technical courses must vary according to the regions.

The supervised farming course should become a continuous program throughout the entire education program. The integrated approach should be used to permit the teacher (1) to plan the course according to the community activities and the competence and maturity of the students; and (2) to tie the practical activities of the students into a whole, thus, emphasizing the relationship of the complex farming activities (Deyoe, 1939).

Student Future Farmer Organization activity should be developed further as its value is unanimously recognized in the developing countries neighboring to South Vietnam (Hudli, 1958; Mollar, 1958; Shah, 1971). The Future Farmer Organization can replace civics since its purpose is to develop good citizenship and leadership.

The evaluation system should continue along the present path, i.e., the awarding of a degree based on student achievement at the school. Objective tests should be developed and the training of teachers in measurement should be accomplished.

All Vietnamese agricultural teachers should come from a teacher training institution. In the teacher training program, the following items must be given importance: professional education, technical education (Martin, 1971), student teaching (Alonzo, 1967; Martin, 1971) and selection of the student teacher centers (Solero, 1965).

Technical education in the teacher training program should emphasize manipulative skills and practical experiences and be taught by methods other than lecture.

Teacher training should be four years in length (Alonzo, 1959). The curriculum must provide a general education, a professional education, and a technical education. The general education should include social sciences, communication, physical sciences, biological sciences, and mathematics. The professional education would occupy one-third of the training curriculum (Solero, 1965). Technical education would include 60 to 80 quarter hours or 45 to 60 semester hours of course work (Boucher, 1971). Student teaching should average 12 quarter credit hours (Boucher, 1971) or one semester (Alonzo, 1967) in length.

CHAPTER IV

RECOMMENDATIONS

Findings and interpretations indicate that improvements must be made in the agricultural education program of South Vietnam. These improvements are to be in two aspects: the program itself and in the teacher training. The present chapter is to suggest what improvements should be made. A model of an agricultural education program and guidelines for implementation are suggested with respect to the improvements of the program. An agricultural teacher training curriculum is also recommended to provide the qualified manpower to carry out the educational program.

Proposed Model for an Agricultural Education Program in South Vietnam

1. Background and Assumptions

In the establishment of the proposed model the following assumptions were made:

South Vietnam is mainly an agricultural country. In spite of the ravages of war, its agricultural economic potential still exists.

The development of the potential requires an extensive intellectual investment in secondary agricultural education. The establishment of war refugees in farming and the high percent of the population engaged in and to become engaged in farming creates the need for a short-term or part-time training curriculum in agricultural education.

The developing trend of today's agriculture suggests that both farming and non-farming careers be given emphasis in the agricultural education program.

Each person is important and has dignity, and thus a right to be educated. Agricultural education has, therefore, a responsibility to provide every person the opportunity to develop to the fullest extent. Furthermore, vocational development is a process of growth and development (cognitive, psychological, affective). The agricultural education program, thus, should provide experiences, visual stimuli, affective awareness, cognitive information and psychomotor skills to enhance the vocational development processes of awareness, exploring, establishing and maintaining oneself in the world of work.

2. Proposed Model

Taking into consideration the above assumptions, a proposed model is presented on Charts 4 through 10. The model has the following characteristics:

a. Objectives

to develop agricultural competencies needed by individuals engaged in or preparing to engage in production agriculture;

to develop agricultural competencies needed by individuals preparing to engage or engaged in agricultural occupations other than production agriculture;

to meet the manpower needs of the country;

to develop awareness and appreciation for career opportunities in agriculture;

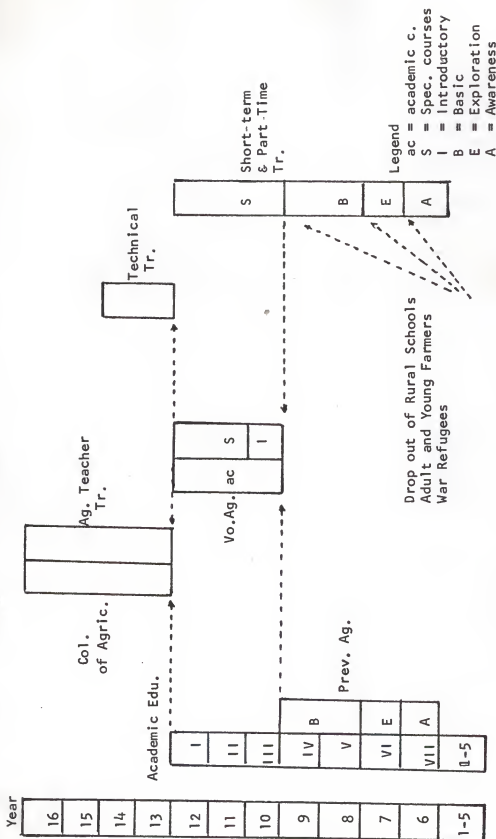


Chart 4 - Proposed Model for An Agricultural Education Program in South Vietnam

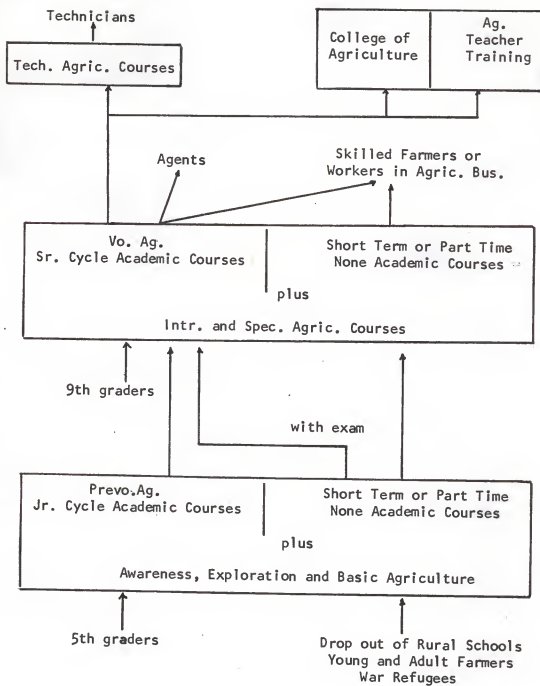


Chart 5 - Proposed Model for an Agricultural Education Program in South Vietnam - Flow Chart and Cur. Content

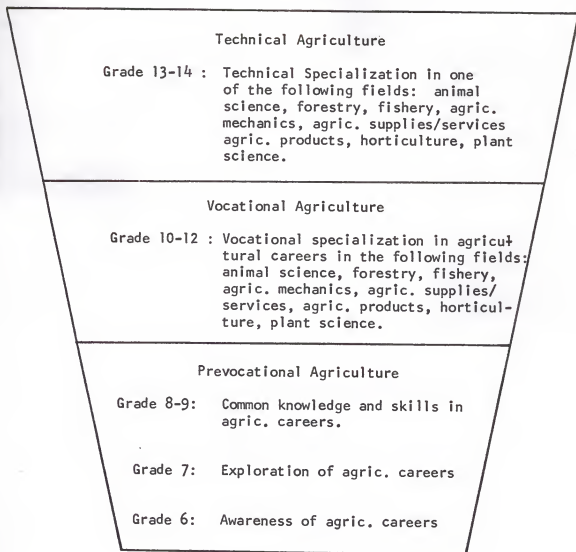


Chart 6 - Proposed Model for an Agricultural Education Program in South Vietnam - Vocational Development

Division of Agricultural Education
 Division of Academic Education
 Provincial Agency of Education
 Advisory Committee and Cur. Council of the School
 Decision makers in Curriculum Content
 Factors to be considered: individual and
 community needs and interests, agric.
 cross-section in the location of the school

Integral part of Jr. High School program (6th to 9th grades).

Can be taken out and replaced by another prevocat. curriculum.

Recruits: 5th graders.

Graduates: holders of Agric. Jr. Diploma

Content: academic courses (75%), agric. courses (25%)

Objectives: awareness, exploration of agric. careers
 in plant science, horticulture, agric.
 products, agric. supplies/services, agric.
 mechanics, fishery, forestry, animal science.

Time Allotment: 5 hrs. a week.

Courses: awareness and exploration courses and basic
 principles in agriculture.

Teaching Procedures: lecture, field trip, discussion,
 demonstration, land lab., work experience,

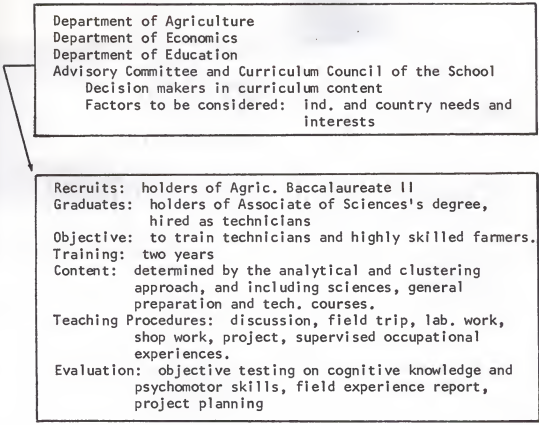
Evaluation: objective testing with equal emphasis on
 cognitive knowledge and psychomotor skills.

Chart 7 - Proposed Model for an Agricultural Education
 Program in South Vietnam - Prevocational
 Agriculture Curriculum.

Division of Agricultural Education
 Division of Academic Education
 Provincial Agency of Education
 Advisory Committee and Curriculum Council of the School
 Decision Makers in Curriculum Content.
 Factors to be considered: individual and
 community needs and interests, agric. cross-
 section in the location of the school

Separate from Sr. Cycle Academic program
 Recruits: holders of Junior Diploma
 Graduates: holders of Agric. Baccalaureate II, hired as
 Agents
 Content: academic courses (60%), agric. courses (40%)
 Objective: vocational specialization
 Time Allotment: 10 hrs. a week
 Courses: intr. and basic spec. courses in agric. produc-
 tion and non-farming agric. business
 Teaching Procedures: lecture, discussion, field trip,
 demonstration, supervised experiences
 Evaluation: objective testing with equal emphasis on
 cognitive knowledge and psychomotor skills

Chart 8 - Proposed Model for an Agricultural Education
 Program in South Vietnam - Vocational Agriculture
 Curriculum



Department of Agriculture
 Department of Economics
 Department of Education
 Advisory Committee and Curriculum Council of the School
 Decision makers in curriculum content
 Factors to be considered: ind. and country needs and interests

Recruits: holders of Agric. Baccalaureate II
 Graduates: holders of Associate of Sciences's degree, hired as technicians
 Objective: to train technicians and highly skilled farmers.
 Training: two years
 Content: determined by the analytical and clustering approach, and including sciences, general preparation and tech. courses.
 Teaching Procedures: discussion, field trip, lab. work, shop work, project, supervised occupational experiences.
 Evaluation: objective testing on cognitive knowledge and psychomotor skills, field experience report, project planning

Chart 9 - Proposed Model for an Agricultural Education Program in South Vietnam. Technical Agriculture Curriculum

Division of Agricultural Education
 Provincial Agency of Education
 Provincial Agency of Agriculture
 Advisory Committee and Curriculum Council of the School
 Decision makers in Curriculum content
 Factors to be considered: ind. and community needs agric.
 cross-section in the location of the school

Recruits: Drop out of rural school youth, adult and young farmers, and war refugees.
 Objectives: to help recruits establish in farming or go back to school for further vocational education.
 Training: short term or part time, flexible entry.
 Content: awareness, exploration of agric. careers, vocational specialization
 Teaching Procedures: lecture, discussion, demonstration, land lab., shop work, supervised occupational experiences
 Evaluation: objective testing with emphasis on psychomotor skills

Chart 10 - Proposed Model for an Agricultural Education Program in South Vietnam - Short-term and Part-Time Training.

to develop the abilities in human relations which are essential in agricultural occupation;

to develop the abilities needed to exercise and follow effective leadership in fulfilling occupational, social and civic responsibilities.

b. Organization

The program consists of four levels of curricula: the prevocational level, the vocational level, the technical level and the short-term or part-time level.

The prevocational agriculture program (Charts 4, 5, 6, 7) is an integral part of the four year junior high school curriculum. Thus, there is only one track in the junior high school curriculum. It provides awareness, exploration and basic knowledge about agricultural careers. Graduates of this curriculum can work as semi-skilled workers or go to the next level of education: the vocational agriculture program.

The vocational agriculture program (Charts 4, 5, 6, 8), parallel to the senior cycle academic high school curriculum, is a three-year curriculum. It includes humanities, sciences and agricultural courses. Humanities and sciences are the same courses taught in the corresponding academic program, but readjusted to fulfill the human and vocational development of the program. Agricultural courses go from introductory specialized courses to specialized courses grouped into the following areas of specialization:

plant science, horticulture, agricultural products, agricultural supplies and services, forestry, fisheries, animal science, and agricultural mechanics. Graduates of this curriculum can work as skilled workers or go into the technical agriculture program for further training.

The technical agriculture program (Charts 4, 5, 6, 9) is offered in two-year college institutions. It further specializes the agricultural student according to his interests and needs and the needs of the community and nation. Technical agriculture offers general preparation courses, sciences, technical courses and supervised experiences (cooperative training). Graduates of this section of the program are holders of the Associate of Sciences degree.

The short-term and part-time training curriculum (Charts 4, 5, 6, 10) provides for competencies and understanding in production agriculture for drop-outs of rural schools, young and adult farmers, and war refugees. It includes all the aspects of preparation for agricultural careers provided by the prevocational and vocational agriculture: awareness, exploration, career preparation from basic skills to specialization.

c. Flexibility and Continuity of Education

The flexibility of the agricultural education program is provided by the options of specialization provided at the voca-

tional and technical levels. It is also provided by the emphasis of curriculum content fitting the agriculture and the needs of the regions. Students in a certain track of specialization will receive the same courses. In other words, agricultural education of South Vietnam is still guided and directed toward the needs of the country and the best interest of finding a job for the students.

The continuity of education in the model is provided by flexible connections between the various sections of the program. Students from the academic program can join the program at the 6th grade, at the first year of the vocational agriculture level or at the first year of the technical agriculture level. Drop-outs of rural schools, war refugees, and young and adult farmers can receive training in production agriculture to become semi-skilled or skilled farmers. They can also get into the vocational agriculture program for further advancement in education.

Students from the prevocational agriculture level can go up to the college level and finish as Technicians, Engineers, or Agricultural teachers. So can the drop-outs from rural schools (Charts 4 and 5). Both of them can also become semi-skilled or skilled farmers, semi-skilled or skilled workers in non-farming agricultural occupations through the short-term or part-time training programs.

d. Balance

The program is balanced since the academic courses (humanities and sciences) and some agricultural courses (leadership) support the understanding of technical subjects. Other agricultural courses provide the technical skills (Charts 6, 7, 8, 9).

The program takes into consideration the human processes of growth and development. Students are led step by step from awareness of man's total environment, including agriculture, to the exploration of opportunities in agricultural occupational careers, then to basic and common knowledge of skills required of all persons in planning careers in agricultural production or agricultural businesses to basic competency required in each agricultural career, and finally to further specialization (Chart 6).

The individual needs and interests and the community needs and problems are considered by both the national and local government educational agencies and by advisory committees. Their recommendations on what curriculum is to be offered and what content is to be emphasized will be executed by the curriculum council. The council's job is to adjust the curriculum to the situation while maintaining the standardized quality required by regulations governing the type of degree to be awarded.

The program takes into consideration the nature of knowledge and learning. The increase of agricultural courses from 5 hours a week, i.e., 25 percent of the program at that level (pre-vocational agriculture), to 10 hours, i.e., 40 percent (vocational agriculture) and finally 100 percent (technical agriculture) is less than the load presently carried by students in the current program. It also reduces the emphasis on replicative use of knowledge. Students will have more time to assimilate the information. Interpretive and applicative use of knowledge will be possible. It fits easily into the whole secondary educational program without any decrease of quality since the training time is only lengthened.

The program uses a combination of curriculum designs. It focuses on individual needs and interests and in community needs since these are the factors considered in the choice of the curriculum and/or emphasis of the content (Charts 7, 8, 9, 10). The program also focuses on subject matter in the pre-vocational and vocational level, and on specific competencies in the latter part of the vocational agriculture level and in the technical agriculture level (Chart 6).

Guidelines to Implement the Model

The following guidelines are suggested to implement the model:

1. Curriculum Content

The courses are of five types: career awareness, career exploration, basic principles, vocational specialization, and technical specialization.

Career awareness courses are provided in the prevocational agriculture level and the short-term and part-time training program. Their content vary with student and community needs and interests and the agriculture of the region. Career awareness is provided in plant science, soil science, forestry, animal science, agricultural mechanics, fish science, and leadership development (Chart 7).

Career exploration courses follow the awareness courses and are used in the same curricula. Like them, their content should vary with the same factors. They provide exploration of careers in plant science soil science, forestry, animal science, fishery science, agricultural supplies, agricultural product processing, and agricultural mechanics. Each course consists of: kinds of occupations, level of employment, nature of work, preparation needed for job entry, range in pay, and manual and intellectual experiences.

Basic principles taught in the latter part of the prevocational level (8th and 9th grades), include: basic principles of plant science, basic principles of animal science, basic principles of soil science,

basic principles of agricultural business management, basic principles of fishery, basic principles of forestry, basic principles of agricultural mechanics, and basic principles of leadership development.

Next come the introductory courses for vocational specialization which are provided to all students during the first year of vocational agriculture. Their content varying with the agriculture of the region should be deeper, or more specialized, than the basic principles so there is not repetition of content for the prevocational students. Yet they still provide basic agricultural knowledge needed by academic students just entering the program. The introductory courses are offered in eight groups: plant science, animal science, soil science, agricultural business management, fishery, forestry, agricultural mechanics, and leadership development.

The specialized courses vary with the field of specialization chosen by the students in the second year of the vocational education level program and at the beginning of the technical level. The specialized courses are offered in eight groups: plant science, horticulture, animal science, forestry, fishery, agricultural mechanics, agricultural supplies and agricultural products. According to the needs and interests of the students, needs of the community, and upon the recommendations of responsible agencies, the curriculum council combines the groups of courses. Vocational students should be given a broader base of specialization than technical students.

Specialized courses in the technical curriculum are offered in areas similar to the vocational level. Subject matter and experiences in these specialized courses, however, should be determined by the analytical and clustering approach instead of a subject matter one. Furthermore, the specialization should be in one area instead of a combination of areas. As academic high school graduates are admitted to this section of the program, the technical curriculum also includes general preparation subjects (15 percent) such as foreign languages and communications; sciences (25 percent) such as math, physics, chemistry, in addition to the technical subjects (60 percent). Part of the technical training should be in the form of supervised occupational experiences.

2. Areas of Specialization

The following specialization areas are offered to meet the agricultural development needs of the country:

Plant Science Major--Students in this major should have courses in cereal crops, small fruit crops and vegetable crops. The organized subject matter and practical experiences should be designed for study and application to these major crop enterprises. Among the considerations emphasized in instruction are genetics, nutrition, soils, plant pathology, entomology, disease and pest control.

Horticulture Major-- Students in this major should have courses in floriculture, landscaping, greenhouse operation and management,

nursery operation and management, fruit tree culture, orchard operation and management. Organized subject matter and practical experiences are concerned with plants used principally for ornamental and fruit production purposes. Instruction emphasizes knowledge, understanding, and skills important to establishing and managing horticulture enterprises.

Animal Science Major--Students in this major should have courses in poultry and duck production, swine production, sheep and goat production, rabbit production, beef cattle and buffalo production, dairy cattle and dairy buffalo production, and horse production. Emphasis on large or small animal and bird production depends on the agriculture of the region. Among the considerations emphasized in instruction are selection, breeding, nutrition, animal health, housing, feeding practices, management and marketing.

Forestry Major--Students in this major should have courses such as: Vietnam's forests; mensuration, reforestation, forest protection, forest management, logging, harvesting and transportation, wood conservation, improvement and use, wildlife management. The organized subject matter and experiences should be concerned with the principles and processes involved in management, utilization, and protection of forest lands and resources.

Fishery Major--Students in this major should have the organized subject matter and experiences designed for the study of and applica-

tion to fish hatchery operation, fish raising, fish catching, fish and sea products processing and conservation of water resources.

Agricultural Mechanics Major--Students in this major are offered a combination of specialized subject matter and activities designed for study of and application of technical skills in jobs such as: oxy-acetylene welding, arc welding, concrete and masonry, power mechanics, painting, preserving and finishing, making and interpreting drawings, wood and synthetics, tool fitting, plumbing, surveying, operating farm machinery, soldering, electricity, and metals.

Agricultural Supplies and Services Major--In this major, subject matter and learning experiences are concerned with preparation of students for occupations involved in providing consumable supplies used in the production phase of agriculture and in occupations involved in providing credits or loans to agricultural producers.

Agricultural Products Major--In this major a combination of subject matter and learning experiences is designed to teach basic principles and management decisions involved in the science and technology of farm products including marketing, inspection, and processing. The groups of products include meat, fish, poultry, eggs, dairy products, fruits, vegetables, cereal grains, oil seeds, cotton, tobacco and rubber.

3. Curriculum Development

The individual interests, community needs, and the actual or

anticipated agricultural occupations should be evaluated by governmental education agencies both at the national and local level and by the advisory committee of the school to provide a basis for emphasizing certain units in the curriculum content for each particular region. The advisory committee must include representatives from the student-parent association, agricultural production, and agricultural related businesses. In the development of course content, curricular material (subject matter and experiences) should be planned with production agriculture receiving higher priority than non-farming agricultural occupations. Curricular development for the entire program should follow: the pattern as illustrated on Charts 4 and 5. Curricular development for each curriculum and for agricultural subjects should follow Charts 6 through 10. In addition to the emphasis on individual and community needs and interests, the attention of the agricultural cross-section of each region where the school is located, is focused on the prevocational and vocational level, while performance and specific competencies are focused on the technical level.

4. Staffing Pattern and Methodology of Teaching

The present South Vietnamese agricultural teachers have different and/or varying levels of skill performance and professional experiences. Thus, differentiated staffing is recommended. The faculty must have two groups-- the curriculum council and the teaching staff. The curriculum council consists of specialists in research, logistics, guidance,

testing and diagnosis, media, and curriculum. The council meets with the master teachers to develop curricular materials. The teaching team uses one of the following two patterns: (a) the master teacher supervises and coordinates the work of his instructors in teaching the entire discipline or occupation; the instructors teach the students in large or small groups or as individuals and are assisted in their work by paraprofessionals, teacher aids or technical assistants; (b) the master teacher and his instructors teach the technological materials; the paraprofessionals, teacher aids or technical assistants provide the practical experiences with or without the supervision of the master teacher. The teaching team should utilize the lecture method very little. It must emphasize innovative types of teaching such as discussion, demonstrations, field trips, land laboratories and programmed instruction. Supervised occupational experiences and Future Farmer activities should emphasize practical experiences in farming and non-farming agricultural occupations and in leadership that classroom instruction is unable to provide.

5. Evaluation

Objective tests on cognitive knowledge and manipulative skills should be provided instead of essays. Essays could be used, however, when students are tested on higher levels of knowledge (analysis, synthesis, evaluation). The level of objectives in the testing increases with the level of the program. Standardized tests are to be

developed, must cover every aspect of the program content, and be well prepared for each grade and curriculum level. The tests should be made public. This helps the teachers in the instruction program and enhances the students' learning. Entrance examinations should be avoided except for those students coming from the short-term and part-time training curriculum. It should be used only to insure the quality of students while still serving the needs of the country in qualified manpower for agricultural development. Degrees should be awarded on student achievement at school. Close supervision of the testing must continue to insure quality of the education.

A Proposed Agricultural Teacher Training Curriculum

1. General Suggestions

As findings indicate, weaknesses in South Vietnam's program of agricultural education come from two main causes: the curriculum and the teachers. This section is to suggest an agricultural teacher training curriculum. The proposed curriculum is to educate teachers to carry out a new program of secondary agricultural education according to the model previously suggested.

The curriculum should be expanded from the present two-year junior college agricultural teacher training curriculum into a four-year curriculum. The present curriculum covers 1920 hours of theory

and practice corresponding to 120 semester credit hours. As in the program of secondary agricultural education, the present teacher training curriculum focuses on subject matter and memorization. A four-year curriculum will give students more time to assimilate their knowledge so as to be able to use it in an interpretive and applicative way. The curriculum should include: technical subjects, sciences, general preparation, and professional courses.

a. Characteristics of Technical Subjects

In a developing country the prospective agricultural teacher needs a broad general preparation and at the same he has to be a specialist in some technical field of agriculture. Furthermore, all South Vietnamese agricultural high schools are multiple teacher schools. The present agricultural status of the country puts the needs of teachers majoring in agronomy and animal science at the top of the list of priorities. Other types of agricultural teacher training curriculums can be constructed along the same model.

A curriculum of agricultural teacher training should, therefore, have fundamental courses for broad technical preparation. The student teacher should be provided with introductory courses over a wide range of agricultural subjects and develop mastery over a certain technical agricultural field. Such a student teacher will develop a feeling of assurance in his future

role of instructor and change agent.

The fundamental agricultural courses required of all student teachers should be courses such as: fundamentals of crop production, introduction to animal science, general agricultural mechanics, principles of agricultural economics, applied meteorology, basic forestry, agricultural supplies, and others.

Specialized courses will vary with the student's major. As the number and type of agricultural teachers needed is decided at each recruitment, as required by Vietnamese regulations, the students must choose their major when applying for admission. Guidance and orientation must, therefore, be provided prior to the entrance examination and again later in the choice of courses to make up each individual program to fit his needs and what is required.

All agricultural courses taught should utilize innovative methods such as group discussion, programmed instruction, supervised experiences, and field trips. The content should focus on occupational competencies (manipulative skills and practical experiences) while maintaining all theoretical knowledge necessary to provide a good foundation. Receiving such an education, student teachers will be more prepared to use other methods of teaching than lecture. They will focus less on replicative knowledge and possession of theoretical subject matter. Such an

education requires close coordination between the teacher training institution and the College of Agriculture.

b. Justification for the Sciences

In addition to the agricultural courses, the teacher training curriculum should include sciences. Science subjects function in providing facts and principles necessary to the students to grasp the agricultural technology or in coordinating the technologies studied under several phases of agriculture. They also serve to give the student an intellectual appreciation of the service that he will later render in the teaching of agriculture. Finally, they enable the student, as a teacher, to follow the interests of the pupils beyond the immediately useful agricultural technology, and assist pupils in correlating their study of agriculture with other studies of the high school curriculum which they follow. The first function should be given high priority in the choice of science subjects in the curriculum.

Basic sciences required of all students could be: chemistry (Inorganic chemistry, quantitative analysis, and organic chemistry); physics, with emphasis upon mechanics, electricity; and mathematics. In addition, students in agronomy or forestry are required to study botany and biochemistry; those in animal science or fish science to study zoology and biochemistry; those in agricultural mechanics to study statics and dynamics.

c. Characteristics of General Preparation Courses

Courses in communications and sociology are imperative. Furthermore, an effective means of reaching and holding the interest of the future teacher's community is writing for the press regarding problems in agriculture and the services provided by agricultural education. This technique can be acquired through a course in Agricultural Journalism. Another imperative course which should be provided in South Vietnam is Agricultural Literature, a library science. Agriculture taught at the secondary level in South Vietnam is an applied science to which new knowledge and information is constantly added. Agricultural Literature should include as its main features:

A review of the sources and kinds of agricultural publications, including reference books, textbooks, government publications, periodicals, and non-technical agricultural literature.

Information as to how to keep abreast with current agricultural publications, whether books, bulletins, or periodicals.

Elementary instruction in the use of books and enough of their classification, cataloguing, labeling, and repairing to be able to establish and direct the care of a school's collection of agricultural publications so as to make the collection the most useful to pupils.

Expertise in library science will help the teacher organize and build his courses and lessons properly and keep them up to date. The course will also be of value in teaching pupils how to use the library--a necessary skill since the student will be using the programmed instruction learning method and other such methods in the continuous learning process.

Since there is a dearth of agricultural literature in Vietnam, the curriculum requires an additional course: foreign language (French or English).

d. Characteristics and Content of Professional Training

Every course in the training curriculum should be a needed course, a practical course, which will result in better teaching ability when the student teacher goes out to the secondary school to do the job for which he is prepared. His training should be such that he would be able to use it soon after getting into the classroom. The following courses and their content seem to be reasonable requirements:

Theoretical Training

Education Psychology--this course should stress the application of psychology to teaching problems in Vietnam's rural population. The course may include a brief review of basic principles of psychology, an emphasis on dynamic psychology, individual differences, principles of learning, transfer of training, and the nature of reasoning.

Counseling and Guidance--this course should cover the teacher's role in personal guidance of the student in his vocational development. Basic principles for helping the individual's personal growth and development in formal, informal, and professional human relationships and those in vocational orientation and development should be emphasized.

Principles of Agricultural Education-- a course including a general survey of the philosophy, objectives, history, development and present status of agricultural education in South Vietnam.

Curriculum Planning in Agricultural Education--this course should cover the theories of curriculum development. patterns of curriculum development in agricultural education, and application activity. The application activity is to familiarize the student in curriculum planning to meet community needs. It will include planning, teaching learning activities, teaching calendars, and evaluation procedures. Community surveys and use of the advisory groups should also be stressed.

Methods in Teaching Agriculture--a course on methods of teaching agriculture to include: course planning, subject matter organization, educational technology, and evaluation.

Audio-Visual Methods and Materials in Instruction--a course on the principles of development and use of audio-visual materials in the teaching of agriculture. Emphasis should be on practical, cheap, and easy to construct aids and equipment.

Measurement and Evaluation of Agricultural Education--

a course on the basic principles and methods of measurement and evaluation of pupil learning in schools and the application of these principles and methods in agricultural education.

Supervised Experiences--a course in planning, devel-

oping, providing and supervising agricultural occupation experiences. Emphasis is on supervision of experiences in farming.

Agricultural Extension--a course on extension philoso-

phy, programs, methods, and leadership principles.

Agricultural Youth Programs--a course to develop under-

standing and abilities in organization and development of 4-H and Future Farmers Youth programs.

Practical Training

These experiences should be of two types--observation of good secondary agricultural teaching and practice teaching.

Observation of teaching should follow a definitely outlined plan. It should be systematic and progressive. Student teachers must be taught what and how to observe. Practice teaching should be done in selected agricultural schools having well trained and experienced agricultural teachers serving as supervising teachers. The student teachers should first observe in the classroom with a

view to future teaching of the class. The student then acts as an assistant, prepares lesson plans for criticism, teaches a single lesson, and finally takes charge of the class for several lessons. He should accompany the supervising teacher on trips for supervision of home projects, gaining familiarity with the teaching of supervised occupational experiences. Later, he may take an active part as an assistant in supervising projects, checking reports, keeping records, and other related duties. During the practice teaching period, the student teacher should make a survey of the local school and agricultural situation similar to that done by an agricultural teacher as a preliminary to taking up work in a new school and community. The student teaching experience should be closely planned, coordinated and supervised by the teacher training institution, the cooperating schools, and the supervising teachers.

2. Specific Suggestions

a. Philosophy

The economy in South Vietnam is mainly agricultural. The long and ravaging civil war has destroyed much of its once flourishing agricultural potential. South Vietnam must now import foods instead of exporting them as formerly. Yet, there is still opportunity for a new economic start. One of the main factors in the food and natural resource development is qualified manpower.

A sound agricultural teacher education curriculum is vital to the training of such manpower.

b. Objectives

The curriculum is to prepare teachers to carry out the agricultural education program at the secondary and the post secondary levels--two phases of the South Vietnamese agricultural education program which produces skilled manpower and technicians needed in food production and natural resource development.

The curriculum is to train two levels of teachers: the agricultural teachers for the prevocational, the vocational and the short-term or part-time agricultural education, and the agricultural teachers for postsecondary or technical agricultural education.

The curriculum concerns itself with only the most needed fields of agriculture dealing with food production and natural resource development--agronomy, animal science, forestry, and fishery.

The curriculum leads to two degrees--Bachelor in Agricultural Education and Master in Agricultural Education. The Bachelor's Degree is offered to anyone who would like to be certified to teach at the prevocational and vocational levels, i.e., to implement all curricula in agriculture below the technical level. The Master's Degree in Agricultural Education is offered to those

desiring to go beyond the Bachelor's Degree in Agriculture and who would like to become agricultural teachers, or to those holding a Bachelor's in Agricultural Education who want to improve themselves and/or advance in the teaching career. Holders of the Master's degree are allowed to teach in the technical or postsecondary agricultural education programs.

c. Requirements for Admission

Admission to the Bachelor's Curriculum in Agricultural Education

High School Students--Applicants must have a Baccalaureate II and be in good health. Those who pass a competitive entrance examination consisting of a written exam covering mathematics, physics, chemistry and biology, and an oral exam in the form of a presentation of a topic assigned at random with twenty four hours of preparation are admitted.

Junior College Students--Applicants must have the Associate of Art or Science degree. They must meet the general preparation requirements including college sciences (physics, chemistry, mathematics, and biological courses) and humanities (college sociology, communications). Applicants must present a satisfactory academic record. A quota is established at each recruitment according to the needs of the government and the applicants presenting the

best overall record are given first priority for admission.

All completed courses classified as humanities, sciences, and agriculture taken at the junior college will be examined and given credit by a committee of admission. Not more than 72 quarter credits or 48 semester credits can be approved.

Admission to the Master's Curriculum

Applicants must be holders of the Bachelor's degree in Agricultural Education or a Bachelor of Science in Agriculture, Animal Science or Forestry. They must have a grade point average of not less than 15 over 20, i.e., not less than 3.0 or at least two years of experience in teaching in a secondary school.

d. Graduate Requirements

Bachelor's Degree--To graduate from the agricultural teacher training curriculum, a student aiming at a Bachelor's degree must satisfactorily complete the following requirements: (1) a minimum of 136 semester credit hours or 204 quarter credit hours; (2) at least an overall average of 12 over 20, i.e., 2.4 overall grade point average; (3) a 10 over 20 average in the professional education and in his area of specialization; and (4) write a paper on a problem in agricultural education.

Master's Degree--A student aiming toward the master's degree in agricultural education must meet the following requirements: (1) complete a minimum of 40 semester credit hours or 60 quarter credit hours; (2) have had a minimum of 24 semester hours or 36 quarter credit hours in professional education in the undergraduate and graduate level, but in no case skip the core courses of the graduate level; (3) have a 12 over 20, i.e. 2.4 overall grade point average; and (4) write a thesis on a problem in agricultural education.

c. Course Offerings

The Bachelor of Agricultural Education curriculum includes core courses such as these:

Basic Sciences (minimum requirement--25 quarter credits)

math, physics, chemistry, biochemistry, botany, zoology, statics, and dynamics.

General Preparation (minimum requirement--25 quarter credits)

courses include communications, sociology, agricultural journalism, and agricultural literature.

Professional Courses (minimum requirement--50 quarter

credits) include educational psychology; counseling and guidance, principles of agricultural education, methods in teaching agriculture, curriculum planning in agricultural education, audio-visual methods and materials in instruction

measurement and evaluation in agricultural youth programs; supervised occupational experiences, student teaching (one quarter).

Technical Courses (minimum requirement--105 quarter credits) are chosen from the offerings of a college of agriculture working in cooperation with the agricultural teacher institution .

The choice is left up to the students and the agricultural teacher educators. The individual program must include: (1) introductory courses in plant science, horticulture, animal science, forestry, fishery, agricultural mechanics, agricultural products, agricultural supplies and services; and (2) in-depth specialization in one of the above fields or in one of the present fields of specialization offered at the college level in South Vietnam: agronomy, animal husbandry, forestry, fishery, agricultural mechanics.

The Master's of Agricultural Education curriculum includes professional, technical and statistical courses such as Introduction to Statistics for the Behavioral Sciences and Analysis of Designed experiments.

Professional courses include:

Administration of Agricultural Education--basic principles

of administering a program of secondary agricultural education on the national, provincial and school level.

Supervision of Agricultural Education--concepts and supervisory procedures pertaining to supervision of different facets of the program of secondary agricultural education--national, provincial, and school levels.

Foundations of Program Planning for Agricultural Education--socio-economic forces, school-community relationships, principles, concepts, and practices affecting policy and program planning in agricultural education.

Besides the above required courses, the professional education requirement is met by the undergraduate courses.

Technical course work is also required. Students whose background is in agricultural education should be recommended to meet the degree requirements by taking more courses in his field of technical teaching. Student holders of a Bachelor's degree in agronomy, animal science, forestry, or fishery, should concentrate more on professional education.

The teacher training program at this level, as in the Bachelor's degree, should be planned by both the teacher and the student to meet graduation requirements, occupation qualifications, and the country's needs for teachers.

CHAPTER V

SUMMARY AND CONCLUSIONS

Background of the Problem

The economy of South Vietnam is mainly agricultural. Its agricultural education program was begun in 1917 by the French Protectorate and was designed to train civil servants to assist the French in ruling the country (1917 - 1945). The agricultural education program, reorganized by the South Vietnamese government, was designed to also provide qualified trained manpower for the government staff (1952 - 62). The South Vietnamese government, however, felt that the reorganized program did not fit the needs of the country. Many improvements were made hesitantly. In 1967 upon the request of the South Vietnam government and upon the invitation of the United States Agency for International Development, the University of Florida, Gainesville, Florida, sent a team to survey the agricultural education program of South Vietnam and make recommendations for reorganizations and improvements. Those recommendations and subsequent help from the University of Florida, however, concentrated in the higher education level and at the National Agricultural Center of Saigon. No recommendations had been made with respect to the secondary agricultural education pro-

gram where the intellectual investment of a developing agriculture should be.

Purpose of the Problem

The purpose of the problem was to establish a model for an agricultural education program in South Vietnam, and to suggest an agricultural teacher training curriculum. The teacher training curriculum is the subgoal of the study.

Methodology

The historical approach was used. The problem was approached through the following analyses of data:

1. Review the literature and research done in the United States and neighboring countries of South Vietnam to determine the criteria for a sound secondary agricultural education program and agricultural teacher training curriculum.
2. Analysis of the potential of agriculture and the needs of manpower for development of the potential in South Vietnam. Both agricultural and manpower needs would indicate whether an agricultural education program is justified.

3. Analysis of the past and present agricultural education programs of South Vietnam. Such an analysis evaluates the past trend and effectiveness of the present program.

Limitations of the Problem

The problem was subjected to three limitations: method limitation, literature limitation, and author bias and knowledge gaps.

Findings

1. Review of Literature

The review of literature and research in the United States and neighboring countries of South Vietnam indicated:

Agricultural Education Program

Agricultural education is essential to the development of the economics of Thailand, Taiwan and the Philippines whose economies are mainly agricultural.

Agricultural education must go hand in hand with rural development. It is in the secondary level of agricultural education where there must be an intellectual investment to achieve the national potential economic development.

Planning of agricultural education programs was accomplished through a combination of designs. Through the survey of indi-

vidual and community needs and interests to determine the objectives of a program, the program worker focused on individual interest and community problems. When developing the curriculum content, he focused on subject matter (prevocational) and vocational agriculture) or on specific competencies (vocational and technical agriculture).

Four types of program or curriculum planning had been used. Two of them concentrated on subject matter following the traditional and integrated curriculum designs. One aimed at specific competencies--specialized course design. The fourth one went one step further and tested its program after development with a focus on either subject matter or specific competencies.

Five procedures were used to determine the curriculum content; three of them, the analytical, the experimental, and the clustering procedures were used in research. The judgmental procedure, however, was widely used by the curriculum worker, while the consensual procedure was found inadequate.

Agricultural Teacher Training Curriculum

Six important role items in agricultural teacher education were: technical agriculture, professional education, program flexibility, student teaching and professional internship, job placement and organization.

Two role items found least important by research in the United States but stressed in research in the Philippines were selection and recruitment and cooperative personnel and agencies.

In the United States, generally the training program required 60 to 80 quarter hours (45 to 60 semester hours) in technical agriculture, and 12 quarter hours (7 1/2 semester hours) in student teaching. In the Philippines, it was recommended that a four year curriculum or 152 semester hours be provided. Twenty two percent of the curriculum should be in technical education, twenty two percent in basic sciences, and sixteen percent in professional education.

2. Agricultural Potential and Needs of Manpower for Development of Such Potential

Agriculture has been the most important sector of South Vietnam's economy. It was estimated that 70 to 80 percent of her work force was currently involved directly in agriculture production. There were about two million farm units and over 250,000 fishermen. Agriculture has been the principal source of exchange with agricultural products constituting 90 to 95 percent of the value of all exports.

At the present time, South Vietnam is apparently experiencing a shortage of agricultural products. In spite of government control, prices of agricultural products as a group have nearly tripled since 1964. Production of rice has fallen from an average of 5 million tons a year (1960 - 64) down to 4 1/2 million tons (1967 - 68). It is no longer exported. In 1972 rice import totaled 300,000 tons. Exports

of rubber fell from 70,000 tons (1955 - 64) to 29,000 tons (1971).

The shortage is apparently due to lack of security and an increase of population. While rice production increased 15 percent in the last decade, South Vietnam's population gained one third. In 1972, the cultivated rice area was still at 2.6 million hectares, after a low of 2.2 million hectares.

In spite of all the low production the agricultural potential still seems to exist and can be expanded with know-how. Rice production increased 15 percent due to the use of fertilizers and improved seeds. Fish catch rose from 52,000 metric tons (1957) to 588,000 metric tons (1971) through the training of fishermen in the use of motor boats. Total pork production increased 8 to 10 percent annually in recent years. Poultry production rose from 9 1/2 (1959) to 20 million heads (1962) and remains there. Vegetable production has increased from 133,000 tons (1965) to 192,000 tons (1967). Controlled forest resources of which one fifth of the hardwood and one half of the mangroves were reported destroyed, still yielded 52,706 cubic meters of pine and 656,647 cubic meters of timber in 1971. It was predicted that production over the period 1970 - 1990 would exceed the 1967 output by 150 percent for crops, 120 percent for livestock, and 90 percent for fish. Soils and climate of South Vietnam were found propitious to agricultural development and diversified agriculture. More than two million hectares of potential crop land was still unused.

Surveys of prospective needs indicated that: (1) for staple food such as cereals, fish vegetables and oil, local per capita expenditures continued to rise for each higher household expenditure group, but the rise was not as pronounced as they were for foods such as poultry, pork, beef, fruits, and others high in the consumer preference ranking; (2) nearby markets for South Vietnamese agricultural products such as food and fiber were still good. Sixty six percent of the combined US \$6 million import of Hong Kong, Singapore, Republic of Korea, Japan and Taiwan in 1970 were cereal grains, fruits, vegetables, natural fibers, and oil seeds. Since 1960, import of any of the above countries has increased from two to five times; (3) world demand of rice was predicted to rise moderately, but that of coarse grain would grow faster; world demand for high protein oilcakes was projected to increase as fast, or faster, than supply; world demand of natural rubber was projected to increase at a rate of 2.3 to 5.2 percent by 1980.

Survey of labor force indicated that 69.5 percent of South Vietnamese labor force were engaged in agriculture. (Table 2). It was estimated that an annual average of 173,750 new members would engage in agriculture in the next decade. A survey of war refugees indicated that at least 360,000 war refugees would settle in farming when peace comes. A survey of the needs of technicians and professional people, both for the government and the private sector, indicated a need of 2,717 college graduates and 7,945 vocational trainees in the next decade.

To face the training of such manpower, the present agricultural education program was developed to hold less than 2 percent of the student population (Table 2). It has produced in the period 1952 - 72 only 580 Engineers, 907 Technicians, 951 Agents, 437 junior cycle teachers and 30 senior cycle teachers (Table 6).

3. Agricultural Education of South Vietnam and its Program

The agricultural education program of South Vietnam was started in 1917 by the French Protectorate to provide the needed staff for the government: engineers (1918), veterinarians (1917), forest rangers (1943), and agents (1917). The training consisted of a professional curriculum at the college level and a technical curriculum at the forest ranger and agent level. Student qualification requirements increased with the year and the training program underwent many changes for the School of Agriculture. But little changes were done for the School of Veterinary Medicine and the agent and forest ranger training.

South Vietnamese agricultural education programs were started in 1952 with American help. From 1952 to 1962 the goal was also to meet the government need for qualified trained agricultural personnel as Engineers, Technicians and Agents. In spite of some improvements the program was still very much like the French, i.e., a professional training at the college level and a technical training at the Technician and Agent levels.

In 1962, the leadership of the South Vietnamese agricultural

education program was moved from the Department of Agriculture to the Department of Education. The training program was lengthened at every level. At the secondary education level it was lengthened by the addition of a program parallel to that of the academic high school. The addition officially called secondary agricultural education, consisted of prevocational agriculture (6 - 7th grades), junior cycle vocational agriculture (8th - 9th grades), and senior cycle vocational agriculture (10 - 12th grades). The program was a combination of the academic high school curriculum, (humanities: 27.5 - 36 percent, sciences: 17 - 27.5 percent), and agricultural courses (33 - 38 percent) (Chart 3, Appendix 5). The technical training, lasting only one year for either Agent or Technician, became more specialized as students in the Agent training had to have the agricultural Junior Diploma while students in the Technician training had to pass the agricultural Baccalaureate II. Agricultural courses (basic agriculture in the junior cycle vocational agriculture, specialized courses and specialization in the senior cycle vocational agriculture) had in fact lengthened the Technician training from 3 years (before 1962) to 4 to 6 years (after 1962) (Charts 1 and 2, Appendixes 1 through 4). Short-term training was added to the program when agricultural education of South Vietnam moved in to take over the agricultural training for the ethnic minority farmers. The relation of this training to the program is weak (Chapter 1).

The objectives of the present South Vietnamese agricultural education program expanded from simply meeting the government's need of agricultural staff (before 1962) to: (1) to provide vocational agriculture; (2) to provide Technician and Agent training; (3) to provide short term training to rural, out of school youth and adult farmers; (4) to provide special vocational agriculture to the ethnic minorities; (5) to disseminate new and improved agricultural technology; and (6) to prepare students for college. However, objectives (1), (2), (4), and (6) were pursued the most.

Heavily influenced by the French trained agricultural educators, the South Vietnam agricultural education program focused on subject matter (Chart 3). It was heavy in selective nationwide exams and awarded the Junior Diploma (at the 9th grade), the Baccalaureate I (at the 11th grade) and the Baccalaureate II (at the 12th grade) degrees. The program consisted of many courses of which the content was heavy in theory (Appendix 6). Students went to class 36 to 40 hours a week. The instruction stressed replicative use of knowledge.

The program has had the following qualities: (1) agricultural students, Technicians, and Agents were no longer looked down on by academic students because equivalent degrees or requirements were added; (2) more flexibility and continuity in the education system. Improvements had been made such as: (1) supervised farming changed from pure hard labor and field practice to project planning, record keeping, and project implementation; (2) the Future Farmers of Vietnam were

introduced into the school activity; (3) the teaching of humanities and sciences was designed to help vocational development and training; (4) degrees were awarded on student achievement at school; and (5) objective testing was introduced.

Recommendations and Conclusions

The main weaknesses of the present agricultural education program in South Vietnam was the program itself and the teacher training curriculum. However, the South Vietnamese program was not entirely bad. In its historical evolution, it picked up improvements which make it very much like a sound program as indicated by research. A model from which new changes in structure could be made would certainly help increase its efficiency, especially if there were qualified teachers to implement it. The following recommendations were made:

1. Model of an Agricultural Education for South Vietnam

The secondary agricultural education program should provide for four sets or levels of curricula: the prevocational agriculture, the vocational agriculture, the technical agriculture, and the short-term and part-time training (Charts 4, 5, 6).

The prevocational agriculture level comprises 25 percent of the junior high school education program (6 - 9th grades). It should provide awareness and exploration of agricultural oc-

cupations at the 6th and 7th grades and basic agriculture at the 8th and 9th grades. Its graduates can go on to the vocational agriculture curriculum or work as semi-skilled farmers or workers in non-farming agricultural occupations (Chart 7).

The vocational agriculture curriculum should be parallel to the academic senior high school education program (10th - 12th grades). Its curriculum should provide adjusted academic courses (humanities and sciences) and a vocational training program (40 percent of the curriculum). Academic courses should help fulfill human and vocational development objectives of the program. The vocational courses should help fulfill human and vocational development objectives of the program. The vocational courses should provide introductory courses at the 11th and 12th grade levels. Specialization should be on a broad base in a combination of the following areas: plant science, horticulture, agricultural products, agricultural supplies and services, agricultural mechanics, animal science, forestry, and fishery. The combination should depend on individual and community needs, interest, and on national demand. Vocational graduates could go on to the technical level curriculum, to college, or to work as skilled workers in production agriculture or other agricultural occupations. They could also be hired as agricultural Agents (Chart 8).

The technical agriculture curriculum should be provided in

two-year college institutions. Its curriculum should consist of general preparation, sciences and technical subjects, and provide deeper specialization in one of the eight areas cited above. Graduates of this section of the program could be hired as Technicians in production agriculture or other agricultural occupations by the South Vietnamese government or private sector (Chart 9).

The short-term or part-time training should provide agricultural education to drop-outs of rural schools, young and adult farmers, and war refugees preparing to engage in farming or seeking improvements in farming skills. The curriculum content should consist of agricultural courses provided in the prevocational and vocational levels of agriculture. Graduates of this training program could work as semi-skilled or skilled farmers, or get into the main stream of agricultural education for further education (Chart 10).

Besides national objectives, government education agencies at the national and local levels, advisory committees of the schools, and a curriculum council should decide the local objectives of the program, the curricula to be offered, and the curriculum content to be emphasized to meet the agricultural potential and needs of the region, and the community and individual needs and interests. Besides a focus on individual needs

and community problems, the curriculum should be designed with its stress on subject matter at the prevocational agriculture level and the first year of vocational agriculture. It must emphasize, however, on specific competencies at the last part of the vocational agriculture program and in the technical agriculture program (Chart 7).

Since South Vietnamese agricultural teachers vary in levels of skill, performance and professional experience, differentiated staffing is recommended. The faculty and staff should include a curriculum council and a teaching staff. The curriculum council should consist of experts and develop the curricular material. The teaching staff, using team teaching, should implement the curriculum. Lecture should be used very little. Instruction should be provided by the use of innovative methods of teaching such as discussion, demonstration, field trips, projects, and laboratories, supervised occupational experiences, and programmed instruction.

Entrance exams should be avoided except for those coming from the short-term or part-time training to insure the quality of students of the program as well as to open the program for everyone (Charts 4, 5). Awarding of degrees should be based on student achievement at the school. Objective testing on cognitive knowledge and manipulative skills should be provided instead of

essays which could be used in testing students' analysis and synthesis or evaluation ability. Standardized tests should be developed, covering every aspect of the program content and made public to facilitate teaching and enhance learning.

2. Agricultural Teacher Training Curriculum

The training should be a four-year curriculum with content consisting of technical subjects, sciences, general preparation courses, and professional courses.

Courses included in sciences should help: (1) student teachers to grasp the agricultural technology; (2) to coordinate the technologies studied under the several phases of agriculture; (3) to give student teachers an intellectual appreciation of their future jobs; and (4) to enable student teachers to follow pupil interest and help the pupils in their study of agriculture. In addition to botany and biochemistry for the agronomy or forestry major, zoology and biochemistry for the animal husbandry major, statics and dynamics for the agricultural mechanics, all student teachers should have college physics, chemistry and mathematics.

Student teachers should have general preparation in communication, sociology, agricultural journalism and agricultural literature (library science).

Technical courses should be of two types: fundamental courses over a wide range of agricultural subjects and a mastery

over a certain technical agricultural field. Specialized courses should vary with the student's major, needs and interest. All technical courses should be taught using innovative methods and their content should emphasize both manipulative skills and cognitive knowledge.

Professional courses should result in better teaching when student teachers go out to do the job for which they are prepared. Professional courses should train student teachers in educational psychology, counseling and guidance, curriculum planning, methods of teaching, use of audio-visual aids, measurement and evaluation, extension and youth programs. Further training could be done in administration, supervision, and program planning. All student teachers should be given well planned student teaching experiences.

Two levels of agricultural teacher training should be provided: Bachelor of Science and Master of Science in Agricultural Education. Students applying for the bachelor's degree could come from vocational agriculture, junior colleges and academic high schools to be trained to become agricultural teachers. The master's degree should be used: to upgrade agricultural teachers to teach technical agriculture and to hold administrative positions; and to attract graduates from the College of Agriculture into teaching.

The above recommendations are based on the best judgment of the author based on facts reported in the findings and his knowledge about the Vietnamese society. However, because of the delimitations of the research methodology, any program of agricultural education and teacher training developed after the model and the suggested teacher training curriculum should be constantly evaluated. Follow-up of outcomes of the secondary agricultural education program and technical agriculture programs is suggested as a mandatory service of the school, local or national agricultural education agency.

APPENDIXES

APPENDIX I

AGENT TRAINING CURRICULUM

(Before 1962)

(Adapted from Order 331 - BCN - ND dated Sept. 15, 1957)

First Semester (Both Sections)

	<u>Theory</u>	<u>Practice</u>
Math	36	--
Physics, Chemistry	36	--
Zoology	54	36
Botany	54	36
Introductory Animal Husbandry	54	36
Introductory Agriculture	54	36
Wood and Iron Works	--	72
Total	<u>288</u>	<u>216</u>

Second Semester (Both Sections)

Physics, Chemistry	54	--
Rural Constructions	36	18
Rural Engineering	36	18
Hydraulics	18	18
Meteorology	18	18
Agricultural Economics	18	--
Surveys	18	36
Introductory Forestry	36	18
Agric. Cooperative and Credits	18	--
English or French	18	--
Bookkeeping	18	18
Civics	18	--
Farming Experiences	--	72
Total	<u>306</u>	<u>216</u>

Third Semester (Agric. Section)

Agricultural Chemistry	18	--
Food Crops Processing	36	36
Plant Diseases	36	36
Entomology	36	18
Agricultural Botany	36	18
Rice Growing	36	36
English or French	36	--
Farming Experiences	--	72
Total	<u>234</u>	<u>216</u>

Appendix I - continued

<u>Fourth Semester (Agric. Section)</u>	<u>Theory</u>	<u>Practice</u>
Industrial Crops	54	36
Secondary Food Crops	54	36
Rubber, Tea, Coffee	36	36
Vegetables and Flowers	36	36
Rural Legislation	18	--
Fruit Crops	36	18
Sericulture	18	18
Farming Experiences	--	<u>72</u>
Total	<u>252</u>	<u>252</u>

Third Semester (Forestry Section)

Silviculture	72	90
Wood Technology	90	72
Forestry Economics	36	36
Topography	36	54
English or French	<u>36</u>	<u>--</u>
Total	<u>270</u>	<u>252</u>

Fourth Semester (Forestry Section)

Forestry Legislation	36	--
Forestry Engineering	72	108
Pisciculture and Wildlife Management	36	18
Forestry Management	18	36
Drawing	<u>36</u>	<u>36</u>
Total	<u>198</u>	<u>198</u>

APPENDIX 2

AGENT TRAINING CURRICULUM

(After 1962)

(Adapted from: The Agent Training Curriculum Guidelines,
Department of Education, Republic of Vietnam, and
Order No. 410 - GD - NCKH - ND, March 7, 1966)

Major: AgricultureA. Course Work: 8 months

<u>Subject</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Rural Economics	30	0	3
Rural Legislation	20	10	2
Administrative and Financial Organization in the Vietnamese Government	30	20	3
Farm Management	40	30	3
Cooperatives, Farm Associations & Agricultural Credit	30	0	3
Met. and Organization of Extension Prog.	20	30	3
Met. and Organization of Plant Prot. Prog.	30	30	4
Met. and Organization of Soil Cons. Prog.	30	30	4
Met. and Organization of Water Control Pr.	30	30	4
Method and Org. of Agri. Mechanization Pr.	20	10	2
Rice Growing	40	40	5
Rubber	40	40	5
Flowers, Vegetables and Fruit Crops	30	40	5
Tea, Coffee, Black Pepper and Cacao	30	30	4
Sugar cane and Tobacco	20	20	3
Cotton and Fiber Plants	20	20	3
Sericulture	20	20	4
Cereals, Food Crops and Oil Plants	30	30	3
Pisciculture	30	30	3
Total	540	460	66
Percent	.54	.46	

B. Field Experience: 4 months in private and governmental stations.

Appendix 2 - continued

Major: Animal ScienceA. Course Work: 8 months

<u>Subject</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef</u>
Economics in Livestock Production	30	0	3
Farm Management	20	30	2
Administration and Financial Organization in the Vietnamese Government	30	0	3
Legislation in Livestock Production	20	0	3
Cooperatives, Farm Ass. & Agric. Credit	30	0	3
Met. and Organization of Extension Prog.	20	30	3
Met. and Organization of Animal Impr. Prog.	30	30	3
Met. and Organization of Animal Prot. Prog.	30	30	4
Met. and Organization of Animal Prod. Proc- essing Prog.	30	30	4
Met. and Organization of Food Inspection	20	20	3
Development Program for Livestock Prod.	20	0	2
Horse Raising	20	0	3
Cattle and Buffalo Raising	60	70	8
Goat and Sheep Raising	20	20	3
Rabbit Raising	20	20	3
Swine Raising	60	60	8
Poultry Raising	60	60	8
Pisciculture	30	30	3
Total	550	430	69
Percent	.56	.44	

B. Field Experience: 4 months in private and governmental stations.

Appendix 2 - continued

Major: ForestryA. Course Work: 8 months

<u>Subject</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Forestry Economics	40	40	5
Forestry Administration	40	40	5
Administrative and Financial Organization in the Vietnamese Government	30	0	3
Forestry Legislation	40	0	4
Met. and Organization of Forestry Prot.	20	30	3
Met. and Organization Forestry Exploit.	30	30	4
Met. and Organization of Wood Improvement	30	30	3
Met. and Organization of Wood Utilization	30	30	3
Forestry Management	20	0	2
Dendrology	40	40	5
Silviculture I and II	90	90	4
Forestry Engineering I and II	80	90	10
Pisciculture	30	30	3
Wildlife Management and Hunting Law	20	10	2
Total	540	460	63
Percent	.54	.46	

B. Field Experiences: 4 months in private and governmental stations

Major: Fishery Section (established in 1966)A. Course Work: 8 months

<u>Subject</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Fishery Economics	30	10	3
Fishery Administration	30	0	3
Fishery Legislation	30	0	3
Fishery Management	20	20	3
Administrative and Financial Organization in the Vietnamese Government	30	0	3
Fishery Cooperatives, Assoc. and Credit	30	10	3
Marketing of Fish and Sea Products	30	30	3
Met. and Organization of Improvement of Fish	20	10	1
Met. and Organization of Prot. of Fish	20	0	2
Met. and Organization of Exploit. of Fish and Sea Foods	60	60	8

Appendix 2 - continued

<u>Subject</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Met. and Organization of Mechanization in Fishing	30	30	3
Fish Science	40	30	3
Sea Science	30	30	3
Introductory Pisciculture	40	40	5
Pisciculture I and II	80	60	8
Construction of Fish Market and Harbors	20	10	3
Fish and Sea Food Processing	40	30	4
Fish and Sea Food Inspection	20	30	3
Total	600	400	64
Percent	.60	.40	

B. Field Experiences: 4 months in private and governmental agencies

APPENDIX 3

TECHNICIAN TRAINING CURRICULUM

(Before 1962)

(Orders No. 246 - BCN - ND, June 10, 1958 and No. 3 - BCN - ND - HC
January 8, 1960)A. Agricultural Section

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
<u>First Semester</u>			
English or French	54	--	2
Math	72	--	3
Botany	36	36	3
Chemistry	72	36	4
Climatology	36	36	3
Surveys	18	36	2
General Economics and Bookkeeping	54	--	2
Civics	18	--	1
Home Economics	--	36	-
<u>Second Semester</u>			
English or French	54	--	2
Physics	54	18	4
Zoology	36	36	3
Introductory Agriculture	36	36	2
Introductory Forestry	36	36	2
Introductory Animal Husbandry	36	36	2
Soils	36	36	4
Civics	18	--	1
Home Economics	--	36	-
<u>Third Semester</u>			
English or French	36	--	2
Farm Mechanics	36	36	3
Rural Construction and Industrial Drawing	36	36	2
Hydraulics I	54	18	2
Anatomy and Physiology of the Plant	36	36	3
Food Crops	36	54	3
Fruit Crops	36	36	3
Civics	18	--	1
Home Economics	--	36	-

Appendix 3 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
English or French	36	--	2
Analytical Chemistry	--	36	1
Entomology	54	36	3
Hydraulics II	36	18	2
Rice Growing	36	18	3
Industrial Plants	54	36	3
Fibrous and Spicy Crops	36	18	2
Vegetables	36	36	3
Extension	18	--	1
Home Economics	--	36	-

Fifth Semester: 6 months

Field experiences at various experimental
stations related to agriculture

Sixth Semester

Plant Pathology	54	36	4
Plant Breeding	36	54	4
Food Crops Processing	54	36	3
Food Crops Inspection	36	18	3
Rural Legislation	54	--	3
Soil Conservation	36	--	2
Extension	18	--	1
Home Economics	--	36	-
Total	<u>1548</u>	<u>1080</u>	<u>106</u>
Percent	.59	.41	

B. Forestry SectionFirst & Second Semester

Similar to the Agricultural Section	666	414	42
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Appendix 3 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
<u>Third Semester</u>			
English or French	36	--	2
Farm Mechanics	36	36	3
Rural Constructions and Industrial Drawing	36	36	3
Forestry Botany	36	36	3
Dendrology	36	36	2
Forestry Engineering I	36	36	3
Wood Technology	54	36	3
Civics	18	--	1
Home Economics	--	36	-
<u>Fourth Semester</u>			
English or French	36	--	2
Analytical Chemistry	--	36	1
Entomology	36	18	2
Forestry Science	54	36	3
Forestry Management	36	18	3
Forestry Engineering II	54	36	3
Forestry Economics	36	36	3
Plant Genetics	36	--	2
Extension	18	--	1
Home Economics	--	36	-
<u>Fifth Semester: 6 months</u>			
Field experiences at forestry experimental stations			
<u>Sixth Semester</u>			
Plant Pathology	36	18	2
Soil Conservation	36	--	2
Forestry Science	36	54	3
Wood Technology	54	36	3
Forestry Economics II	36	36	3
Forestry Legislation	36	--	3
Pisciculture	36	18	3
Extension	18	--	1
Home Economics	--	36	--
Total	1548	1080	106
Percent	.59	.41	

Appendix 3 - continued

C. Animal Husbandry Section

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
<u>First & Second Semesters</u>			
Similar to the Agricultural Section	666	414	42
<u>Third Semester</u>			
English or French	36	--	2
Farm Mechanics	36	36	3
Rural Constructions and Industrial Drawing	36	36	3
Hydraulics	54	10	2
Anatomy and Physiology of the Animal	36	36	3
Microbiology	36	18	2
Feeds and Feedings	54	54	4
Civics	18	--	1
Home Economics	--	36	-
<u>Fourth Semester</u>			
French or English	36	--	2
Analytical Chemistry	--	36	1
Poultry and Rabbit Raising	54	54	3
Swine, Goat and Sheep Raising	54	36	3
Cattle, Buffalo and Horse Raising	54	36	3
Animal Parasites	54	18	3
Infectious Diseases	54	18	4
Extension	18	--	1
Home Economics	--	36	-
<u>Fifth Semester: 6 months</u>			
Field experiences at livestock experimental stations			
<u>Sixth Semester</u>			
Animal Breeding	54	36	4
Drugs Use and Animal Surgery	54	54	4
Animal Products Processing	54	36	3
Meat Inspection	36	18	3

Appendix 3 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Rural Legislation	54	--	3
Soil Conservation	36	--	2
Extension	18	--	1
Home Economics	--	36	-
Total	1602	1054	106
Percent	.60	.40	

APPENDIX 4

TECHNICIAN TRAINING CURRICULUM
(After 1962)

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
<u>Common Courses to All Sections</u>			
Administration in Vietnam	30	--	2
Financial Organization in Vietnam	20	30	2
Methods and Organization of Work	20	--	1
Extension Methods	20	30	2
Statistical Methods	30	20	2
Total	120	80	9

A. Rice Production1. Course Work: 6 months

Common Courses to all sections	120	80	9
Botany of the Rice Plant	40	30	5
Weather Requirement	20	10	1
Soil Requirement and Preparation	30	20	4
Water Requirement and How to Supply	30	20	3
Improvement of the Rice Varieties	40	30	5
Rice Planting	20	40	2
Use of Fertilizers	20	10	2
Protection of the Rice Plant	30	30	3
Harvesting, Threshing and Storing	15	15	2
Hulling and Milling	15	--	1
Marketing of Rice	15	--	1
Crops Rotating with Rice Culture	20	20	2
Total	415	305	40
Percent	.57	.43	

2. Field Experiences: 6 months
at agricultural experiment stations
and private enterprisesB. Secondary Food Crops1. Course Work: 6 months

Common Courses to All Sections	120	80	9
Corn, and Cereals other than Rice	40	30	4
Potatoes	50	30	4

Appendix 4 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
Beans and Peas	60	30	5
Cucumbers	40	20	4
Melons	20	10	2
Tomatoes and Hot Pepper	20	10	2
Cabbage	40	20	4
Lettuce	20	10	2
Onion, Garlic	20	20	2
Mushroom	20	10	2
Total	450	270	40
Percent	.62	.38	

2. Field Experiences: 6 months
at agricultural experiment stations
and private enterprises

C. Fruit Crops

1. Course Work: 6 months

Common Courses to All Sections	120	80	9
Plant Propagation	25	25	2
Plant Nutrition and Use of Fertilizers	25	15	2
Plant Protection	20	10	3
Blossoming and Fructification	30	10	3
Storage and Processing of Fruits	30	30	2
Pruning	20	20	2
Citrus	20	10	2
Bananas	20	10	2
Mango	20	10	2
Pineapple	20	10	2
Other Tropical Fruit Crops in Vietnam	40	15	3
Temperate Fruit Crops in Vietnam	15	--	2
Beekeeping	15	15	2
Alternate Crops	20	20	2
Total	440	280	40
Percent	.61	.39	

2. Field Experiences: 6 months
at agricultural experiment stations
and private enterprises

Appendix 4 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
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D. Agricultural Economics1. Course Work: 6 months

Common Courses to all Sections	120	80	9
Introductory Agric. Economics	20	--	2
Rural Legislation	60	--	3
Farm Management	20	--	2
Agric. Bookkeeping	30	30	3
Agric. Credit	20	10	2
Rural Bank	20	--	2
Transportation of Crops	10	20	1
Marketing of Crops	30	10	3
Agric. Statistics	20	20	2
Farmers Association Organization	10	10	1
Farmers Association Management	20	10	2
Bookkeeping in the Farmers Association	30	30	3
Agriculture Cooperatives	20	10	2
Bookkeeping in the Cooperatives	30	30	3
Total	460	260	40
Percent	.64	.36	

2. Field Experiences: 6 months
at agricultural cooperatives, the
Farmers Association and the Rural Banks

E. Farm Mechanics1. Course Work: 6 months

Common Courses to all Sections	120	80	9
Gasoline Engine	20	40	4
Diesel Engine	20	40	4
Electrical Engine	10	30	3
Welding	20	40	3
Blacksmithing	10	20	2
Cold Metal Work	20	30	3
Tractor	20	50	4
Power Tiller	10	50	3
Agricultural Tools	40	50	5
Total	290	430	40
Percent	.40	.60	

2. Field Experiences: 6 months
at the Governmental and private work-
shops

Appendix 4 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
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F. Poultry Production1. Course Work: 6 months

Common Courses to all Sections	120	80	9
Poultry Reproduction	30	20	3
Poultry Breeding	30	10	3
Poultry Feeding	30	30	4
Production and Processing of Poultry Feeds	30	20	3
Poultry Diseases	50	20	5
Poultry Slaughtering and Dressing	30	20	3
Production of Eggs	30	10	2
Production of Chickens	30	10	2
Production of Broilers	30	10	2
Duck Raising	30	10	2
Turkey and Quail Raising	30	10	2
Total	470	250	40
Percent	.65	.35	

2. Field Experiences: 6 months
at government and private livestock
and poultry production enterprises

G. Swine Production1. Course Work: 6 months

Common Courses to all Sections	120	80	9
Swine Reproduction	30	20	3
Swine Breeding	30	20	3
Swine Feeding	30	40	4
Production and Processing of Swine Feeds	30	20	3
Swine Diseases	50	20	5
Marketing	30	10	2
Slaughtering and Meat Processing	40	20	4
Production of Pigs	40	30	4
Production of Meat Hogs	40	20	3
Total	440	280	40
Percent	.66	.34	

Appendix 4 - continued

<u>Subjects</u>	<u>Theory</u>	<u>Practice</u>	<u>Coef.</u>
2. <u>Field Experiences:</u> 6 months at government and private livestock and poultry production			
H. <u>Wood Technology</u>			
1. <u>Course Work:</u> 6 months			
Common courses to all Sections	120	80	9
Forestry Administration	35	20	3
Forestry Policies	40	15	3
Forestry Legislation	40	20	2
Surveys, Inventory	30	(a)	2
Facilities, Equipment in Forestry			
Exploitation	25	(a)	2
Environment Protection	25	(a)	2
Inventory and Exploitation of Forestry	30	(a)	2
Improvement of the Flooded Forests	25	(a)	2
Improvement of the Low Altitude Forests	40	(a)	2
Improvement of the High Altitude and Coniferous Forests	30	5(a)	2
Improvement of the Bamboo and Palm Forests	20	(a)	2
Reforestation	40	5(a)	3
Utilization of Mechanized Facilities in Forest Work	40	35	3
Total	540	180	40
Percent	.75	.25	
2. <u>Field Experiences:</u> 6 months at Thua Thien, Quang Nam, Tuyen Duc, Lamdong, Darlac, Anxuyen, Kien Giang, Phuoc Tuy, Long Khanh. Observation and participation in forest works in above provinces, collection of samples of forest wood and plants.			

APPENDIX 5

PREVOCATIONAL AND VOCATIONAL AGRICULTURE CURRICULUM

Extracted from: The Curriculum of Secondary Agricultural Education, Department of Education

	Junior Cycle			Vocational	
	Prevocational	Grade 7	Grade 8	Grade 9	
Vietnamese	4	4	4	3	
History and Geography	2	2	2	2	21%
Civics	2	2	2	2	4
Foreign Language	5	5	4	4	
Math	3	3	3 1/2	3 1/2	
Physics and Chemistry	2	2	2 1/2	2 1/2	
Biology	1	1	2	2	
Agronomy	2	2	3	3	
Animal Science	2	2	2	2	
Forestry Science	1	1	1	1	38%
Agric. Engineering	1	1	1	2	
Supervised Farming	6	6	6	1	
Physical Education	3	3	3	6	
Drawing	1	1	1	3	
Home Economics or				1	
Wood and Iron Work				1	
Total hours a week	1	1	1	1	
	36	36	39	39	

Appendix 5 - continued

Senior Cycle: Vocational AgricultureA. Agricultural Section

<u>Subject</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>
Vietnamese	3	3	0
History and Geography	2	2	2
Civics	2	2	2
Philosophy	0	0	3
Foreign Language I	2	2	2
Foreign Language II	2	2	2
Physics and Chemistry	4	4	4
Math	4	4	4
Biology	3	3	3
Agronomy	5	6	9
Animal Science	2	1	0
Forestry Science	1	1	0
Agric. Engineering	1	1	0
Supervised Farming	6	6	6
Physical Education	<u>3</u>	<u>3</u>	<u>3</u>
Total hours a week	40	40	40

B. Forestry Section

Vietnamese	3	3	0
History and Geography	2	2	2
Civics	2	2	2
Philosophy	0	0	3
Foreign Language I	2	2	2
Foreign Language II	2	2	2
Physics and Chemistry	4	4	4
Math	4	4	4
Biology	3	3	3
Agronomy	2	1	0
Animal Science	1	1	0
Forestry Science	5	6	9
Agric. Engineering	1	1	0
Supervised Farming	6	6	6
Physical Education	<u>3</u>	<u>3</u>	<u>3</u>
Total hours a week	40	40	40

Appendix 5 - continued

C. Animal Husbandry Section

<u>Subject</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>
Vietnamese	3	3	0
History and Geography	2	2	2
Civics	2	2	2
Philosophy	0	0	3
Foreign Language I	2	2	2
Foreign Language II	2	2	2
Physics and Chemistry	4	4	4
Math	4	4	4
Biology	3	3	3
Agronomy	2	1	0
Animal Science	5	6	9
Forestry Science	1	1	0
Agric. Engineering	1	1	0
Supervized Farming	6	6	6
Physical Education	<u>3</u>	<u>3</u>	<u>3</u>
Total hours a week	40	40	40

E. Agric. Engineering Section

Vietnamese	3	3	0
History and Geography	2	2	2
Civics	2	2	2
Philosophy	0	0	3
Foreign Language I	2	2	2
Foreign Language II	2	2	2
Physics and Chemistry	4	4	4
Math	6	6	6
Biology	1	1	1
Agronomy	2	1	0
Animal Science	1	1	0
Forestry Science	1	1	0
Agric. Engineering	5	6	9
Supervised Farming	6	6	6
Physical Education	<u>3</u>	<u>3</u>	<u>3</u>
Total hours a week	40	40	40

Extracted from: The Curriculum of Secondary Agricultural Education,
Department of Education

APPENDIX 6

TECHNICAL COURSES IN THE VOCATIONAL AGRICULTURE

(Extracted from the Curriculum of Secondary Agricultural Education of the Department of Education, Republic of Vietnam. The numbers expressed after each course are respectively the total number of hours in theory and practice. Both broad field courses and their sub-courses are reported).

Junior Cycle (for all students)Eighth Grade

- Agronomy: principles of agronomy (20-10), climatology and meteorology (15-15), soils (20-10).
- Forestry Science: silviculture and forestry management (20-10)
- Animal Science: feeds and feeding (20-10), livestock care and animal health (15-15).
- Agricultural Engineering: rural architecture (10-5), measurement (10-5).
- Supervised farming (0-180).

Ninth Grade

- Agronomy: plant physiology and genetics (20-10), plant protection (20-10), crops processing (20-10).
- Forestry Science: fishery and wildlife (7-3), forestry work (13-7).
- Animal Science: animal breeding and genetics (20-10), livestock production (25-5), animal product processing (20-10)
- Supervised Farming (0-180).

Senior Cycle: Agriculture MajorTenth Grade

- Agronomy: principles of agronomy (20-10), climatology and meteorology (20-10), soils A (20-10), entomology A (20-10) plant pathology A (20-10)
- Forestry Science: principles of forestry (20-10).
- Animal Science: principles of animal science (20-10), animal feeding (30-0).

Appendix 6 - continued

Agricultural Engineering: rural architecture and agricultural
mechanics (20-10)
Supervised Farming (0-180)

Eleventh Grade

Agronomy: soils B and C (20-20), plant genetics A and B (40-20),
entomology B (20-10), plant pathology A (20-10).
Forestry Science: forestry management and legislation (20-10).
Animal Science: pastures and forage crops (20-10).
Agricultural Engineering: irrigation (20-10)
Supervised Farming (0-180)

Twelfth Grade

Agronomy: specialized agronomy A, B, C, D, E (140-70), crop
processing A, B (40-20)
Supervised Farming (0-180)

Senior Cycle: Forestry MajorTenth Grade

Agronomy: principles of agronomy (20-10), soils A (20-10).
Forestry Science: principles of forestry (20-10), climatology
and meteorology (20-10), mensuration (15-15),
dendrology (15-15), silviculture A (20-10).
Animal Science: principles of animal science (20-10).
Agricultural Engineering: rural architecture and agricultural
mechanics (20-10)
Supervised Farming (0-180)

Eleventh Grade

Agronomy: soils B (20-10)
Forestry Science: silviculture B (20-10), forestry economics
A and B (40-20), forest protection (20-10), fish
breeding (20-10), wildlife protection 20-10)
Animal Science: pasture and forage crops (20-10).
Agricultural Engineering: irrigation (20-10).
Supervised Farming (0-180)

Appendix 6 - continued

Twelfth Grade

Forestry Science: forestry work A, B, C (55-35), forest exploitation (15-15), wood technology (20-10), conservation and improvement of wood (20-10), use of wood and forest by-products (20-10), forest management (20-10), forest legislation (30-0).
 Supervised Farming (0-180)

Senior Cycle: Animal Husbandry MajorTenth Grade

Agronomy: principles of agronomy (20-10), soils A (20-10)
 Forestry Science: principles of forestry (20-10).
 Animal Science: principles of animal sciences (20-10), climatology and meteorology (20-10), feeds and feeding (20-10), pasture and forage crops (20-10), animal nutrition and care (20-10).
 Agricultural Engineering: rural architecture and agricultural mechanics (20-10)
 Supervised Farming (0-180)

Eleventh Grade

Agronomy: soils B (20-10)
 Forestry Science: forestry management and legislation (20-10).
 Animal Science: animal breeding A, B, and C (60-30), microbiology and pathology (20-10), parasitology (24-6), internal and external diseases (24-6).
 Agricultural Engineering: rural architecture and agricultural mechanics (20-10).
 Supervised farming: (0-180)

Twelfth Grade

Animal Science: poultry raising (25-5), swine raising (25-5) cattle, buffalo, sheep, goat, horse and rabbit raising (25-5), contagious diseases (20-10), animal product processing A and B (40-20), food inspection (12-18) economy in livestock production (30-0), farm management (15-15).
 Supervised farming (0-180).

Appendix 6 - continued

Senior Cycle: Agricultural Engineering MajorTenth Grade

- Agronomy: principles of agronomy (20-10), soils (20-10).
- Forestry Science: principles of forestry (20-10).
- Animal Science: principles of animal science (20-10).
- Agricultural Engineering: climatology and meteorology (20-10),
topography A, B (30-30), construction materials and
general architecture (15-15), industrial drawing
(0-30).
- Supervised Farming (0-180)

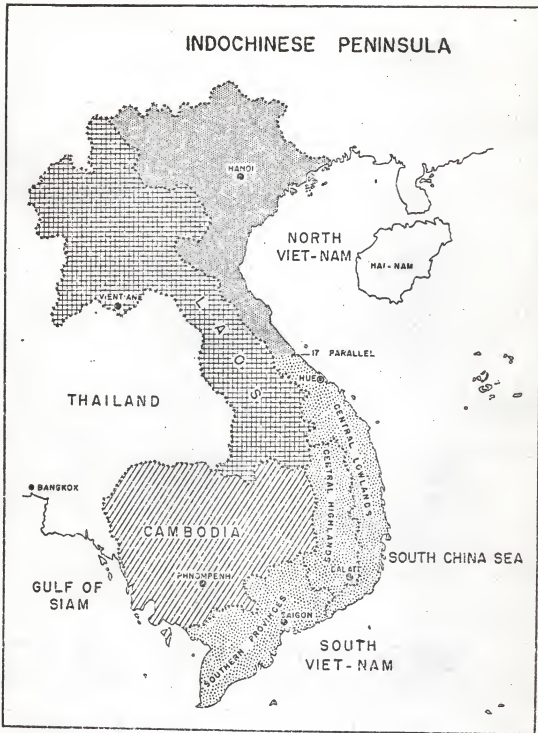
Eleventh Grade

- Agronomy: soils B (20-10).
- Forestry Science: forestry management and legislation (20-10).
- Animal Science: pastures and forage crops (20-10)
- Agricultural Engineering: resistance of construction materials
(20-10), statics (20-10), rural architecture (15-15),
rural roads (15-15), engines (20-10), industrial
drawing (0-30).
- Supervised Farming (0-180).

Twelfth Grade

- Agricultural Engineering: general hydraulics (15-15), agricultural
hydraulics (20-10), irrigation (20-10), agricultural
mechanics (35-25), dam and bridge construction (40-20),
rural legislation and sanitation (25-5), industrial
drawing (0-30).
- Supervised Farming (0-180)

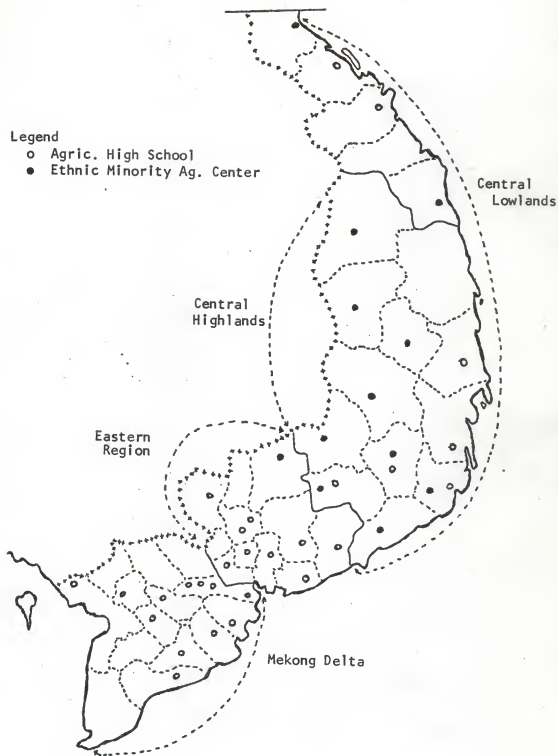
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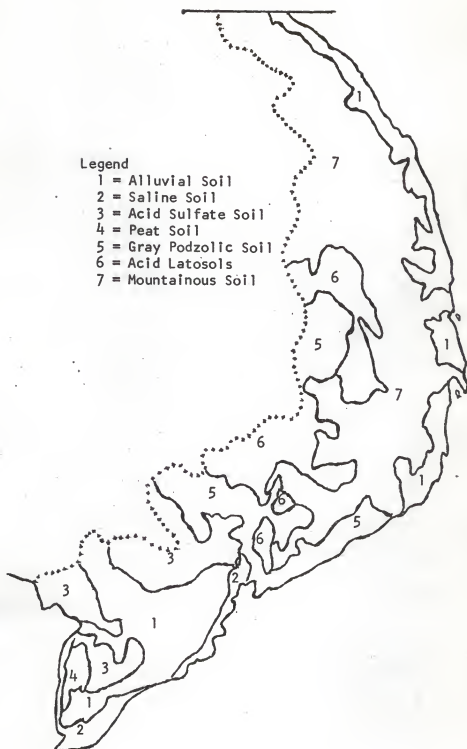
Adapted from: University of Florida Team Survey of Agric. Education
in South Vietnam p. 100

Legend

- Agric. High School
- Ethnic Minority Ag. Center

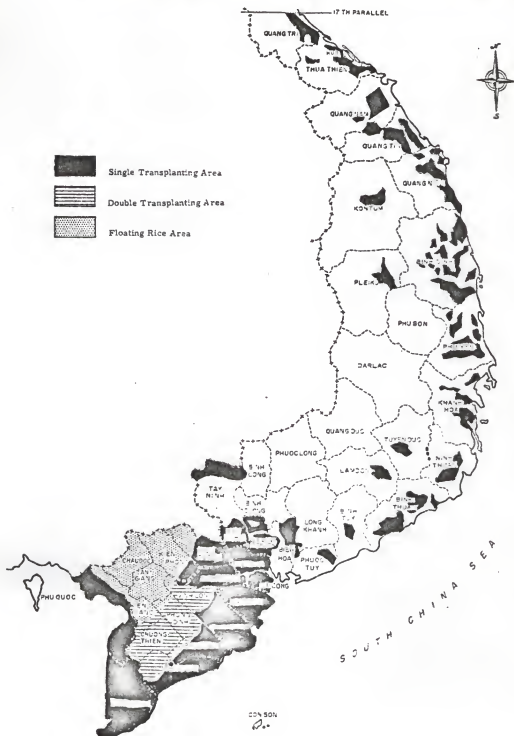


AGRICULTURAL SCHOOLS IN SOUTH VIETNAM

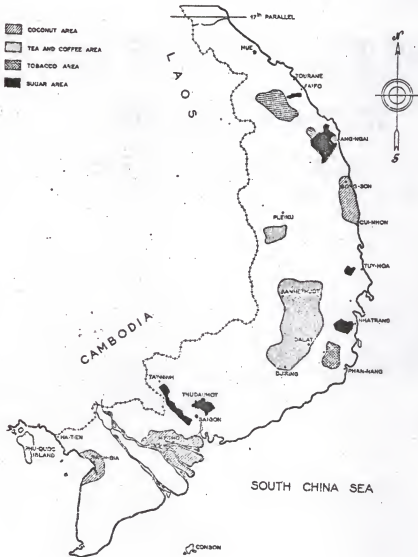


MAJOR SOIL GROUPS IN SOUTH VIETNAM

RICE AREAS OF PRODUCTION



Adapted from: University of Florida Team Survey of Agric. Education in South Vietnam, p. 103



Adapted from: University of Florida Team, Survey of Agric. Education
in South Vietnam, p. 104

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BIOGRAPHICAL SKETCH

Tran Hiep Nam was born in Phnom Penh, Cambodia, on October 14, 1932.

He received his high school education at Lycee Descartes (Cambodia) and his agricultural training at the National College of Agriculture of Baoloc (Vietnam), from which he graduated the first of his class (1959).

He attended Kansas State University (Kansas), from which he received his Bachelor of Science in Agriculture, Magna Cum Laude (1962) and his Master of Science in Animal Science (1963).

From 1963 to 1973 he worked with the Department of Education of South Vietnam as vocational agricultural teacher, Dean of Study of Baoloc Agricultural High School and finally as Deputy Director of the Directorate of Agricultural Education. He also joined the faculty staff of the Agricultural Teacher Training, both at the Directorate of Agricultural Education and at the National Agricultural Center of Saigon.

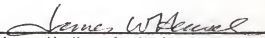
He entered the University of Florida in January, 1973 to pursue his present course of studies and expects to receive the Doctor of

of Philosophy in December, 1974.


Mr. Nam plans to return to the University of Thu Duc where he will be an agricultural teacher educator.

He married Tran Tuyet Nga and the union has produced a son and a daughter, Nang and Nhu.


I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy


James W. Hensel, Chairman
Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy

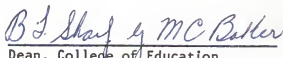

Carl E. Beeman, Co-Chairman
Associate Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


James W. Carpenter
Professor of Animal Science

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1974


Dean, College of Education

Dean, Graduate School